BIW PHASE III/FY-82 SHIPYARD DATA APPLICATION PROGRAM

PANEL LINE/SHOP SCHEDULING AND MANLOADING

INCENTIVE SYSTEM EVALUATION (WELDING)

TASK ES-8-12

Conducted at:

Bath Iron Works Corporation
700 Washington Street
Bath, Maine 04530

Date: 1982-1983

FINAL REPORT

Prepared for:

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SHIPYARD DATA APPLICATION PROGRAM
PANEL LINE SCHEDULING AND MANLOADING
INCENTIVE SYSTEM By: EVALUATION (WELDING)

Bath Iron Works Corporation
Standards Development Team

Report Documentation Page

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BIW PHASE III/FY-82 SHIPYARD DATA APPLICATION PROGRAM
FINAL REPORT

.I. Background

This project has evolved from the National Shipbuilding Research Program which is funded by the Maritime Administration, United States Department of Transportation, for the purpose of making domestic shipyards more competitive with foreign shipyards. Technical direction for this program is provided by the Ship Production Committee of the Society of Naval Architects and Marine Engineers. The Ship Production Committee is composed of several panels, two of which, Panel SP-8 on Industrial Engineering, arid Panel SP-6 on Shipbuilding Standards, make up the Ship Producibility Research Program, managed by Bath Iron Works Corporation, Bath, Maine.

Industrial Engineering Panel SP-8, from which this project generates, was activated in 1978 and has been carrying out two functions. One, the development of engineered labor standards using "MOST" (Maynard Operation Sequence Technique), a relatively new work measurement system that has gained wide recognition as an efficient, accurate tool by the industrial community for work measurement, and two, generally increasing industry awareness of industrial engineering potential. Considerable standard data has been generated over the past few years under this program by the participating shipyards standards development teams. This data has generally been used to make method engineering improvements. Peterson Builders, Inc., through its scheduling

standards pilot project, was the first shipyard to use this standard data base for shop scheduling purposes. The reported favorable results of that project stimulated the follow-on scheduling standards project here at Bath Iron Works.

II. Introduction

The Phase III/FY-82 Shipyard Data Application Program for Bath Iron Works primarily involved the application of engineered labor standards in the area of shop scheduling, labor performance and data simulation in accordance with the SNAME SP-8 "Standard Data Application Guide" (June, 1981). Phase III also included the task of program data coordination for the shared computer system to ensure that maximum benefits could be received from the computer's use and also to coordinate the assigning of consultant service under the program.

The project was conducted generally in accordance with the proposal submitted by Bath Iron Works Corporation for Phase III/FY-82 Shipyard Data Application Program Task ES-8-72 in December, 1981 to the U.S. Maritime Administration. The project was carried out by the Standards Development Team from Bath Iron Works (E. Creswell, M. Cunningham, A. Evan), which had been trained in manual and computer "MOST" and basic industrial engineering practices during Phases I & II of SP-8's Standards Development Program.

This final report documents all the tasks and the procedures followed in performing those tasks as well as the benefits that can accrue from the application of engineered labor standard data.

III. Task #1, Panel Line Shop Scheduling Standards Development Project

A. Procedures f-or Developing Shop' Scheduling Standards

The procedures followed for developing scheduling standards were generally similar to those used by peterson Builders, Inc. for their Pipe Shop Scheduling Standards Pilot Project; with the following exceptions. All "MOST" analyses were developed anew within the MOST Computer System instead of from previously created manual MOST data. Level time standards included only work content items with no allowance for basic personal fatigue and delay. The non-process factor calculation included a basic PFD allowance.

The procedure included the following steps:

- Determine panel line work area layout data (workplace, tools, objects, equipment, operators and carriers) and input to computer.
- Determine all necessary sub-op method steps to cover all shipfitting and welding operations at the panel line.
- Develop MOST analyses for all sub-op method steps using MOST program within MOST Computer System and input to data base.
- Develop combined sub-op groupings that can most easily be frequency counted from plans or bill of materials.
- Develop combined sub-op title sheets for shipfitting and welding operations necessary for generating hull unit standards at the panel line.
- Conduct work sampling study to determine process time and non-process time fractions.
- Calculate a non-process factor.
- Generate hull unit scheduling standards (level time x non-process factor) for sample block of work.
- Evaluate scheduling standards as a tool for predicting actual costs.

*September 1981 - April 1982

B. Panel Line Baseline Data

Type Work Performed: Steel (shell, deck, bhd. plating & framing) flat panels.

- Current Product: Navy (FFG) and Commercial (Falcon Tanker) steel flat panels.

- Work Stations:

1) Plate Blanket Fit Station:. Fixed position semi-automatic, hydraulic/magnetic seam fitting equipment.

2) Plate Blanket Weld Station: First side turn second side weld operation with single or dual arc gantry mounted equipment turn with house bridge crane.

3) Layout Station: Manual operation performed by shipfitters anywhere on panel line.

4) Longitudinal Stiffener Fit Station: Gantry mounted magnetic/hydraulic fitting equipment.

5) Longitudinal Stiffener Weld Station: Gantry mounted automatic Doodlebug fluxcore welding equipment.

6) Web/Misc. Fit Station: Manual operation performed by shipfitters in traditional way.

7) --web/Misc. Weld Station: Semi-automatic gantry mounted fluxcore equipment.

- Work Schedule - Two shift operation with flow over to third shift for welders on a need basis.

C. Work Sampling Study

A ratio delay study was performed at BIW'S panel line work area during the period 9/28/82 through 10/7/82. The purpose of the study was to determine the current level of productive and non-productive time that existed in the work area in order to develop a realistic non-productive factor with which to adjust level time standards to actual work area conditions.

A work sampling worksheet matrix was developed that divided all worker activities into two major groupings; productive and non-productive activities. Also provided were boxes for the observed worker's trade and the time of day of the observation. This was done so that separate statistics could be developed for each trade (shipfitters, welders) being studied. Productive activities were considered to be any that contributed to getting the job done. It included both method and non-method steps. The exception to this was that all rework was considered to be non-productive. Non-productive activities were considered to be those that did not contribute to completing the job and those spent on rework. See Appendix A for sample of worksheet matrix.

Our technique was to patrol the panel line work area at random times throughout the work day and slot each observed worker into predetermined categories on the worksheet matrix. The random times covered all time segments of the first and second work shifts. The third shift was not included because it was only being worked on a part-time basis during the time of the study. A total of 1,331 observations were made, with 766 covering shipfitters and 565 covering welders. The work-sheets were tabulated daily and a running account was kept of the percentages of productive and non-productive observations. Enough observations were taken so that the study results would achieve an accuracy of 95% with a 99% confidence level.

A summary report was prepared outlining the results . of the work sampling study and presented to management. The non-productive elements of the study were itemized and quantified and a list of recommendations were made that(we felt) would help reduce the non-productive time at the work area.

The plan Was to conduct these work sampling studies on a periodic basis, especially if any corrective actions had been taken, to insure that the non-productive factor would reflect the most current conditions at the work area.

D. Hull Unit Work Package Shop Scheduling Standard Development/ Evaluation

The first step to generating computer standards was to develop and input to the data base the basic standard data structure; that is, "MOST" analyses had to be generated for all necessary sub-operation method steps used at the panel line.

The next step was to organize the sub-operation analyses into combined sub-operation parameters that could easily be frequency counted from hull plans or bill of materials lists : and still produce work package standards with acceptable .accuracy. The importance of this step cannot be overemphasized because how well you organize your standard parameters will determine how efficient your standard development system will be.

The final step of computer standards structure development was to list the combined sub-op analyses by trade onto title sheets and input them to the computer data base. The computer was now ready to generate work package standards.* Only the standard parameters work package frequency counts as determined from plans or-work package bill of materials lists and the non-productive factor as determined by work sampling need to be input to the computer to generate work package shop scheduling... . . . . standards.

*See Appendix C for printout of computerized standards structure (MOST analysis, title sheet lists and skeleton standards) backup

The reliability of computer generated shop scheduling standards for forecasting actual expended labor hours was tested on a block of work from our Falcon Tanker Program. Twenty flat panel assemblies from six hull unit work packages that make up a girth section from the midbody of.the tanker were chosen for the test. The standard parameter parts frequency counts for the chosen unit work packages was provided to us by Dept. 84 (Production Planning and Control). Hull unit scheduling standards for the test block of work for both ship-fitting and welding operations were generated in the computer system time standard data base program and then compared to the actual hours expended on those units as recorded on our in-house labor tracking computer printout.

The test evaluation of computer generated shop scheduling standards on the sample block of work indicate .that they were a very reliable tool for predicting actual hours. Overall, the shipfitting standards deviated less than three percent from actuals and the welding standards less than six percent. See Appendix B for results of test in graphic form.

E. Conclusions

1. The MOST Work Measurement Computer System is a sound, reliable tool for measuring actual work content of a job. It will accurately predict how long a job should take if all working time is spent productively.

2. The MOST Work Measurement Computer System data base programs allow for efficient systematic storage of work method analysis data and work package labor standards. The flexibility of the data base programs allows for rapid retrieval of data in whatever format would be most useful for maintaining and updating standards and for more efficient use of standards to control work in process.

3. Computer generated job level standards,when factored by a realistic non-process factor, will reliably predict “will cost” charges (shop scheduling standards).

4. Work sampling studies can accurately project total productive, non-productive percentages for a work area and can serve as a valuable management tool for highlighting potential problem areas that require corrective actions.

5. Manual development of work package parts frequency counts is a labor intense operation,whether for existing manual developed labor standards or for computer generated standards. standard parameters should be designed to minimize this parts counting and still produce work package labor standards with acceptable . accuracy.

F) Recommendations on Computer MOST in Industry

1. Use of computer MOST is basically a support to manual MOST, and in areas where engineered labor standards are sought, computer MOST should be utilized.
2. Once initial engineered labor standard data is developed, it is essential to institute periodic work sampling studies for the work area to insure that the non-process factor reflects current conditions and to identify any problem areas that need corrective action.
3. Use of the format contained herein is judged to be a usable approach to developing scheduling standards.
4. The approach used herein should be applicable to any other area targeted for engineered labor standards.

IV. Task #2, Welding Incentive Program Evaluation and Proposal for Improvement Project

A. BIW Existing Welding Incentive System Baseline Data

- Individual piecework incentive for welders on selected work.
- Piecework standard rates are in dollars per foot of weld based on standard hours per foot of weld times the current first class welder labor rate.
- Bonus is based on excess of earned piecework dollars over current wage rate for hours worked on piecework incentive.
- Only about 8% of total shipyard welding labor hours are covered by welding incentive system. Balance of work is performed at day rate (current wage. rate).-
- Limited group incentive by work area hull, unit work package contract system.
- Union approval required for any incentive rate change.

B. BIW Piecework Standard Rate Evaluation Study

A welding piece rate evaluation study was completed at the beginning of BIW's Phase III program. The study compared some 300 existing welding piecework cates which had been developed over the years to engineered welding standards developed using the MOST Computer System's weld program. The piecework rates were.converted from dollars per foot to hours per foot so that the unit of measure would be the same as the engineered welding standards. A 15% personal fatigue and delay allowance and a 25% earning opPortunity factor, i.e. bonus payout, was calculated into the enginered standards. The study indicated.considerable variety in the., established rates ranging from loose to tight when compared to factored MOST standards. In addition,.it was found that much of the backup data for the existing rates had.been lost. Based on

these findings, we recommended that a complete re-evaluation and adjustment of all BIW piecework rates, along with the development of consistent/formal backup data, be developed using the MOST Computer System where the data would be stored for ease of retrieval and update before proceeding with any program expansion. In support of this recommendation, input have been made to the weld program data base of electrode deposit rates and method as developed by the Welding Engineering Department.

C. Proposals to Produce a More Productive Welding Incentitive System

Two alternative proposals for improvement to our welding incentive system were developed, both of which would involve the development of new sound engineered welding standards using the MOST Computer System.

The first proposal was to refine and expand the present piecework incentive systems The first step would be to gain union acceptance of MOST computer generated engineered welding incentive standards and the complete adjustment of the rate structure. After adjustment of the base rates,the present piecework and area work . package contract incentive coverage would gradually be expanded over a two-year period from the present 8% to 48% coverage. This proposal projected a 30% improvement in manhours could be achieved over regular day work, which would result in over a 100,000. MH/year savings when the 48% coverage was achieved.

The second proposal was to develop a new group welding incentive system based on a relatively new concept of giving recognition and reward for actual percentage productivity gains about an established “average past performance level. The recognition and reward would be in the form of a weekly bonus payment based on a four-week running average of the productivity improvement percent and the base pay for all hours worked. All welders who charge to hull unit work would be included in the program and would receive the same percentage share in his bonus payment. Productivity gains would be measured using computer generated engineered hull unit labor time standards factored by a base period productivity factor to reflect realistic productivity levels during the base period. The base productivity factor would be developed by dividing the sum of closed hull unit engineered time standard hours for the base period by the actual hours spent on those closed units.

Both proposals were submitted to management for evaluation. Although management felt that a group plan could improve productivity, it was rejected in favor or the first proposal to revamp the existing system because it involved less of a radical change and would be easier to accomplish and less disruptive in the work force. In support of this decision, we are presently preparing material to be presented to the union that will clearly explain how engineered welding labor standards would be developed and how engineered welding standards would be used to evaluate and adjust the welding incentive rate structure so that the rates would be more consistent and more beneficial to both union welders and management.

V. Task #3, Demonstrate Benefits of MOST Computer System For Data Simulation

The benefits that could accrue from use of the MOST Computer System data simulation capabilities was demonstrated in the following two main areas during--the Phase III program.

A. Evaluate Alternative Weld Processes for Commercial Ship Construction

The MOST Computer System was used to do a complete synthesis of data and simulation of welding of shell erection butts for our Falcon Tanker Program with alternative welding processes. The simulations compared welding the shell butts with semi-automatic fluxcore process to welding the butts with automatic electroslag process. The simulation clearly showed that the savings in manhours using the electroslag process for the entire Falcon Tanker Program would more than offset the cost of the equipment. A printout of this simulation was used to justify the capital expenditure for the electroslag welding equipment, which has since been used successfully on our tanker program. Doing this evaluation through the MOST Computer System's data simulation capabilities rather than manually has been credited by our Cost Reduction Department with saving $6,800. The successful implementation of more efficient welding equipment has resulted in considerably more savings.

B. Evaluate Alternative Insulation Material Installation Costs

In July, 1982 the Standards Development Team was asked by the cost Reduction Department to evaluate a cost reduction proposal submitted by one of the employees claiming that installation . labor costs could be significantly reduced by switching from the current insulation material being used on our FFG ship program to a proposed new material which had equal insulating qualities and was easier to install.

Two identical areas on one of the ships under construction which requires insulation was chosen for the test evaluation. One area was insulated with the currently used insulation material and the other area was insulated with the proposed new material. The complete process of installation of both materials was observed and a precise method for each was determined. An analysis of each method step was then developed using the MOST Computer System and a standard for each type of material installation was generated.

The data simulation capabilities of the MOST Computer System allowed us to make this evaluation quickly and efficiently. A printout of the simulated data confirmed the claims of the cost reduction proposal. The new material required 18% less labor to install than that required for the currently used material. The data was turned over to the Cost Reduction and Value Engineering Departments for additional evaluation of costs of new material. Ultimately, it was decided that even though labor savings were possible, the added cost of new insulation outweighed the potential savings. For this reason, the new insulation material is not being used at BIW.

VI. TASK #4, PROGRAM DATA COORDINATOR FUNCTION FOR THE SHARED MOST COMPUTER SYSTEM

A. MOST Computer System Revised Weld Program

M. W. Cunningham, from three-man Standards Development Team, worked successfully with H. B. Maynard to develop the requirements for a new welding program which would be more feasible and adaptable to the many welding processes used in shipyards. The new weld program was released to us in October, 1982.for testing and evaluations. We completed the evaluation of the revised weld program in December of 1982 and the program was released for use by all the participating shipyards. Data submittal forms were developed and sent out to all the shipyards for subittingdata for input to the new weld program. See Appendix D for data submittal forms.

B. Universal Data Development and Application

As part of our efforts to make the standard data being developed by the participating shipyards under the MarAd Program more transferable and useful by all, we have prepared an explanatory white paper that outlines the concept of universal data. The paper lists the ground rules and examples of universal data and how it could be used. We have distributed this paper to all the shipyards with the hope that it will stimulate more universal data development which will be usable by all shipyards. See Appendix E for copy of universal data development and application paper.

C. Coordination of H. B. Maynard Consultant Service for SP-8 MOST Users. Task EC-17

In January of 1983, the SP-8 Program Office made arrangements to have Mr. Louis M. Kuh (H. B. Maynard consultant) available for consultant service for the SP-8 MOST users. The Program Data Coordinator was designated to process all requests for consultant service.

Although 30 days were made available for use by the MOST user shipyards, only three days of consultant service were processed through the Program Data Coordinator.

1. NASSCO used one day 12/36/82 to review progress on FY-82 program sheetmetal shop.
2. BSC used two days, 1/31 - 2/1/83 to review data collected on material handling equipment.

See Appenix F for consultant service reports.

APPENDIX A

WORK SAMPLING FORM

WORK SAMPLING STUDY

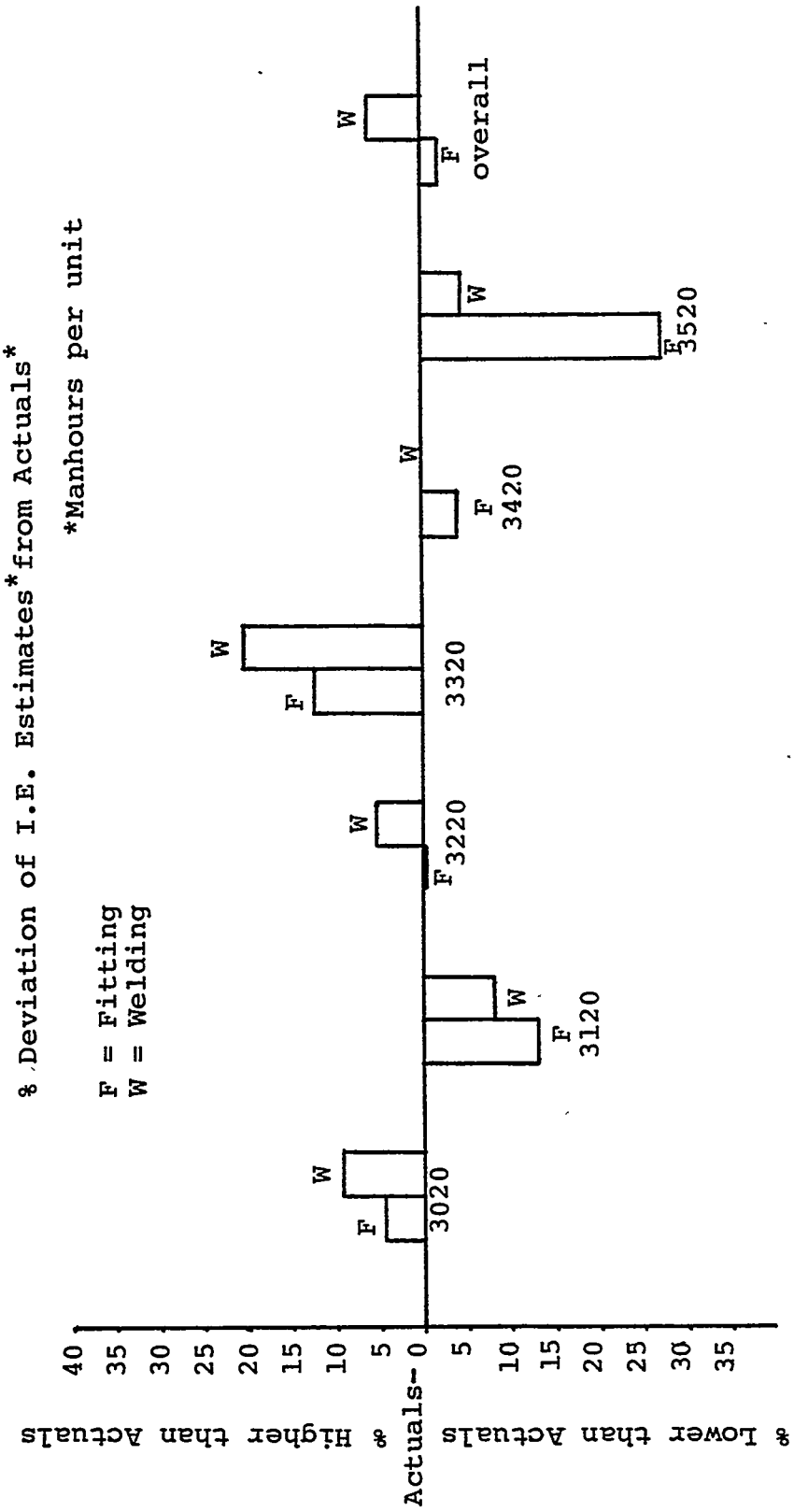
PANEL LINE NO. OF OPERATORS DATE: 9-30-82 BY MLG # 4

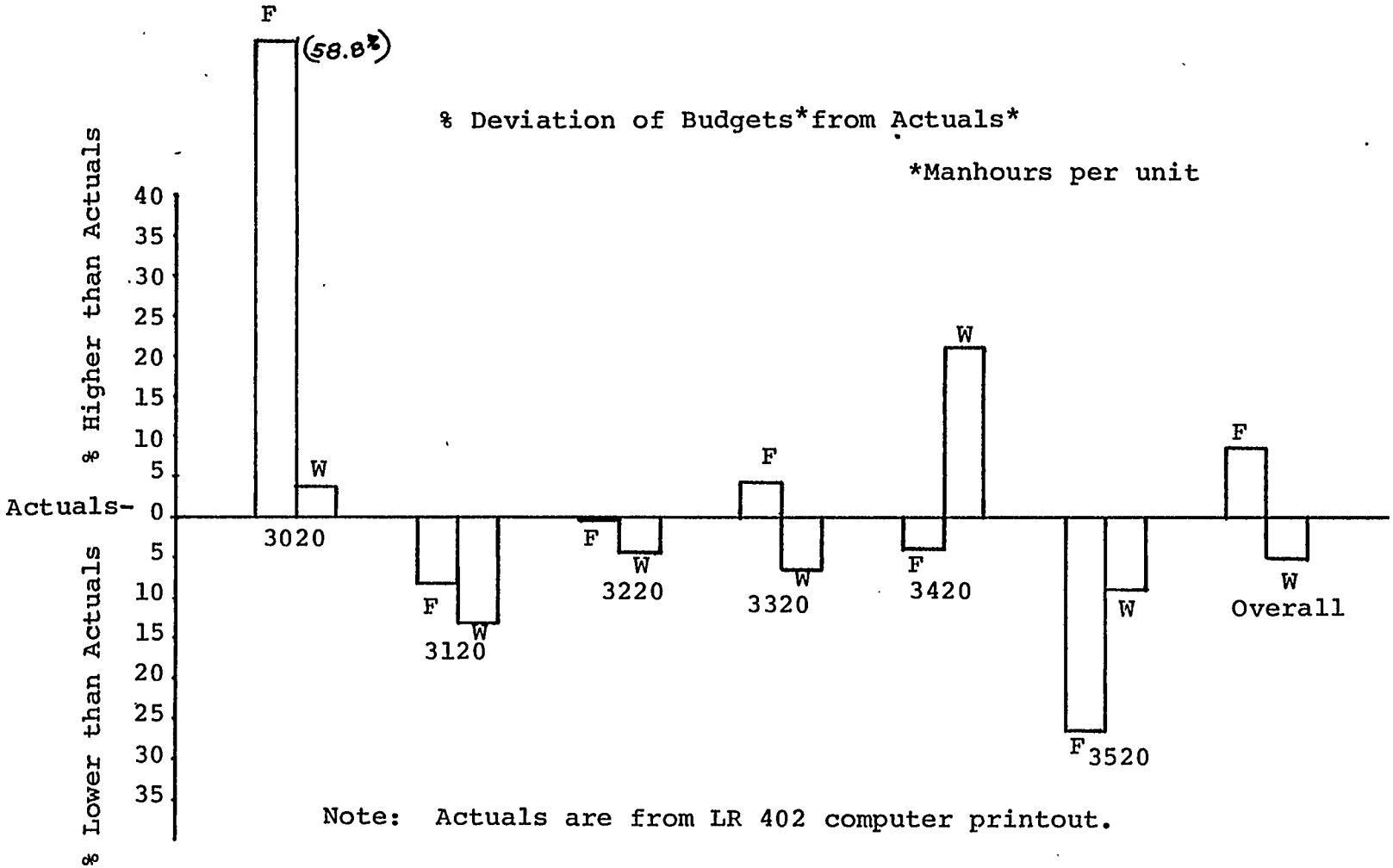
			PRODUCTIVE TIME					NONPRODUCTIVE OCCURRENCES								
Obs. No.	Work Station	Random Time	Stan. Fitting	Non-Stan Fit	Set-up	Weld Arc	Weld (work in)	Mach. Break	Service Wait	Other Delay	Other Dept.	Personal	Idle	Miss.	P.U.	Comments
1	F	3:19P	✓													
2	F			✓												
3	F			✓												
4	W					✓										Lifting Pad
5	W					✓										
6	W								✓							waiting for a crane
7	F								✓							
8	F									✓						SWEEPING
9	F									✓						
10	F								✓							
11	F											✓				
12	F			✓												
13	F											✓				
14	F								✓							
15	W					✓										
16	W											✓				
17	F		✓													
18	W					✓									✓	
19	W											✓			✓	
20	W											✓			✓	
21	W											✓				
22	F													✓		
23	F													✓		
24	F													✓		
25																

APPENDIX B

PANEL LINE I.E. STANDARDS EVALUATION

PANEL LINE 1.E . STANDARD'S EVALUAT ION





Note: Actuals are from LR 402 computer printout.

GIRTH SECTION
FITTING

LOC	DETAIL UNIT/FART	HULL	COST CLASS	ISSUE NO.	RATE M H R .	DATE
127	3021 -STBD.	404	PANEL LINE	3	70.846	17-NOV-82
129	3021+FORT	404	PANEL LINE	3	70.846	17-NOV-82
131	3022-CENTERLINE	404	PANEL LINE	2	192.073	17-NOV-82
133	3121-STBD,	404	PANEL LINE	2	20.592	17-NOV-82
135	3121-PORT	404	PANEL LINE	2	20.592	17-NOV-82
137	3122-STBD	404	PANEL LINE	2	158.267	17-NOV-82
139	3122-[illegible]	404	PANEL LINE	2	158.267	17-NOV-82
141	3221-STBD,	404	PANEL LINE	1	21.619	05-NOV-82
143	3221-FORT	404	PANEL LINE	1	21.619	05-NOV-82
143	3222-STBD,	404	PANEL LINE	3	157.130	17-NOV-82
147	3222-FORT	404	PANEL LINE	3.	157.130	17-NOV-82
149	3321-STBD.	404	PANEL LINE	1	4.071	08-NOV-82
151	3321-PORT	404	PANEL LINE	1	4.071	08-NOV-82
153	3322-STBD,	404	PANEL LINE	1	4.071	08-NOV-82
155	3322-FORT	404	PANEL LINE	1	4.071	08-NOV-82
157	3323-STBD	404	PANEL LINE	2	118.772	17-NOV-82
139	3323-FORT	404	PANEL LINE	2	118.772	17-NOV-82
141	3324-CENTERLINE	404	PANEL LINE	2	174.670	17-NOV-82
163	3420-CENTERLINE	404	PANEL LINE	3	147.383	17-NOV-82
163	3520-CENTERLINE	404	PANEL LINE	2	163.708	17-NOV-82

Total MAN HOURS for search : 1728,569

Number of standards for search: 20

Standards locater number ?

FITTING

I.E. EST. 1728.56

97.4%

ACTUAL 1774.0

BUDGET 1906.0

= 107,4%

ACTUAL 1774.0

LOC #	DETAIL UNIT/PART	Mfg.	UNIT CLASS	ISSUE No.	RATE MHR	DATE
128	3021-STBD.	404	PANEL LINE	3	82.505	17-NOV-82
130	3021-PORT	404	PANEL LINE	3	82.505	17-NOV-82
132	3022-CENTERLINE	404	PANEL LINE	2	234.221	17-NOV-82
134	3121-STBD.	404	PANEL LINE	2	19.360	17-NOV-82
136	3121-PORT	404	PANEL LINE	2	19.360	17-NOV-82
138	3122-STBD.	404	PANEL LINE	2	175.240	17-NOV-82
140	3122-PORT	404	PANEL LINE	2	175.240	17-NOV-82
142	3221-STBD.	404	PANEL LINE	1	20.104	05-NOV-82
144	3221-PORT	404	PANEL LINE	1	20.104	05-NOV-82
146	3222-STBD.	404	PANEL LINE	3	177.360	17-NOV-82
148	3222-PORT	404	PANEL LINE	3	177.360	17-NOV-82
150	3321-STBD.	404	PANEL LINE	1	1.955	08-NOV-82
152	3321-PORT	404	PANEL LINE	1	1.955	08-NOV-82
154	3322-STBD.	404	PANEL LINE	1	1.955	08-NOV-82
156	3322-PORT	404	PANEL LINE	1	1.955	08-NOV-82
158	3323-STBD.	404	PANEL LINE	2	172.563	17-NOV-82
160	3323-PORT	404	PANEL LINE	2	172.563	17-NOV-82
162	3324-CENTERLINE	404	PANEL LINE	2	228.058	17-NOV-82
164	3420-CENTERLINE	404	PANEL LINE	3	134.212	17-NOV-82
166	3520-CENTERLINE	404	PANEL LINE	1	100.372	09-NOV-82

Total man hours for search : 1988.846

Number of standards for search: 20

Standards locater number ?

WEL'D'ING

I.E, EST, 1988.846 / 1887.0 = 105.4%

BUDGET 1788.O / 1887.0 = 94,8%

APPENDIX C

COMPUTERIZED STANDARDS BACKUP DATA

BIW PANEL LINE WORK AREA

INDEX

INTRODUCTION

This volume is a comeilation of all the analyses developed for the Panel Line area, Both shipfitting and welding are thorouhly covered by this document, The work. methods were documented and the best or most Practical methods are included here, After all the manual methods were identified, they were analyzed using an engineered work measurement system (MOST), These analyses (SUBOPERATIONS) become the basic building blocks of a labor standard, The suboperations reflect individual method steps, but can be combined to describe larger, multi step, operations,

The suboperations and combined suboperations which are pertinent to a specific work area are then consolidated on a titlesheet, The titlesheet is merely a list of the analyses developed for a specific work area,

After the titlesheet has been prepared, the analyst must Quantify the work content of the units scheduled to be built at that work area, Frequencies may then be applied to the analyses on the titlesheet and a level time standard calculated, Typically f'reQuences are applied on a per foot, per piece, per shift, or per unit basis,

The level time standard is devoid of allowances, Personal, fatigue and delay allowances may be added to create a real world standard suitable for use as a scheduling or budgeting tool, The allowance factor should be determined by some sort of work sampling such as a ratio delay study,

The standards developed in this manner are realistic and accurate measures of work, They can be reliably used for scheduling, budgeting, or line balancing, but should be modified before being used in an incentive system. These standards are backed by carefully developed suboperational data that provides traceability for the standard, Also the standards can be Quickly and easily updated to reflect actual changes in work methods or to simulate a Proposed change and Quantify the impact of such a change, A very important side benefit of this approach is that it forces you to look closely at the existing work methods, document them, and offer recommendations for improving them.

COMPUTERIZED STANDARD BACKUP DATA

SHIPFITTTNG OPERATIONS

Pages 2 - 109

SECTION 1
SHIPFITTING

1.1 MANUAL METHODS BACKUP

14. MOVE 2 TON WITH BOLT % CLIP AT GENERAL SHIFFIT [25]
PER OCCURANCE OFG: 4 15-JUN-81
5 / 8 FITTING BOLT ON MILD STEEL PLATE
FITTER BEGINS AT JOB

1 PICKUP CLIP WITH BEND			
	A6 B6 G1 A1 BO FO AO	1.OO	140.
2 MOVE BOLT TO CLIP AT SELF AND INSERT SIMO 1 2 3			
	<A1 EO G1 >Al)B0 P1 Al	1.00	30.
3 FASTEN NUT AT BOLT 3 SPINS COMPLEX USING FINGERS			
	Al BO G1 Al BO P3 F6 AO BO FO AO	1.00	120 .
4 HOLL+PLACE ASSEMBLED BOLT % CLIP TO JOB WITH BEND			
	AO BO GO A6 B6 P3 AO	1.OO	150,
5 GET+FUSH TACK-LEAD AT CLIP AND BOLT FOR TACKING PROCESS SIMO 1 2 3 F			
	<Al BO G3 >M1 X42 IO AO	2.OO	S60 .
6 HOLD+MOVE TACK-LEAD TO JOB			
	AO BO GO Al BO P1 AO	1. 0]0	20.
7 FASTEN NUT AT BOLT 10 ARM-STROKES USING WRENCH AND RETURN TO TOOLS			
	A6 BO G1 A6 BO P3 F54 A6 BO F1 AO	1.oo	770 .
	TOTAL TMU		2090.

15, MOVE 5 TON IN DOWNHAND POSITION WITH DOG AND WEDGE AT GENERAL SHIFIFIT **{25}**

PER 0CCURANCE OFG: 4 12-JUN-81
ALL TOOLS AND EQUIP MOVED TO LOCATION PRIOR
* PROCESS TIME FOR MILD STEEL
FITTER BEGINS AT JOB

1	PLACE DOG TO JOB +HOLD		
	A6 BO G1 A6 BO P3 AO	1.oo	160.
2	GET+PUSH TACK-LEAD AT DOG PT 3 S		
	Al BO G3 Ml X1O IO AO	1.OO	150.
3	PICKUP HOOD TO FITTER		
	Al BO G1 A1 BO PO AO	1.OO	30,
4	HOLD+PUSH TACK-LEAD AT DOG FOR TACKING PROCESS		
	AO BO GO M1 X42 IO AO	1.00	430.
5	HOLD+REMOVE TACK-LEAD AND HOOD TO JOB		
	AO BO GO A1 BO P1 AO	1.00	20.
6	MOVE WEDGE TO DOG AND INSERT		
	A6 BO G1 A6 BO P1 Al	1.00	150.
7	FASTEN WEDGE 5 STRIKES USING HAMMER AND HOLD		
	A6 BO G1 A6 BO PO F1O AO BO PO AO	1.oo	230 .
8	INSPECT 1 POINT		
	AO BO GO AO BO PO T1 AO BO PO AO	1.00	10.
9	FASTEN WEDGE 3 STRIKES USING HAMHER AND ASIDE		
	A1 BO G1 Al BO PO F6 Al BO P1 AO	1.OO	110.
10	LOOSEN WEDGE 3 STRIKES USING HAMMER AND RETURN TO TOOLS		
	Al BO G1 Al BO PO L6 A6 BO P1 AO	1.00	160.
11	MOVE WEDGE TO TOOLS		
	A6 BO G1 A6 BO P1 AO	1.oo	140.

TOTAL TMU 1590 .

16, MOVE 1 TON WITH l-TON CABLE LUGALL AT UNIT SHIFFIT {25}
PER OCCURANCE OFG: 4 12-JUN-81
TOOL MUST BE MOVED TO ORIGIN IN APPLICABLE SUB-OPERATION
* ANY POSITION
X DOES NOT INCLUDE ATTACHMENTS
FITTER BEGINS AT JOB

1 GET+PLACE HOIST TO JOB AND INSERT LOWER HOOK			
	A6 BO G3 A6 BO P3 Al	1.00	190.
2 PUSH LOCK AT HOIST			
	A1 BO G1 Ml XO IO AO	1.00	30.
3 HOLD+SLIDE HOIST FROM JOB TO HOOK-UP			
	AO BO GO M3 XO IO A10	1.OO	130.
4 HOLD+PLACE HOIST TO HOOK-UP AND INSERT UPPRPPER HOOK			
	AO BO GO Al BO P3 Al	1.00	50.
5 OPERATE LEVER AT HOIST FOR MOVING OBJECT PF 40 (4)			
	A1 BO G1 (M6)XO IO AO (40)	1.00	2420.
4 FUSH LOCK AT HOIST WITH BEND			
	Al B6 G1 M1 XO IO AO	1.OO	90.
7 OPERATE LEVER AT HOIST FOR UNLOCKING PF 4 (4)			
	A1 BO G1 (M6)XO IO AO (4)	1.00	260 .
8 PUGH +HOLD LOCK AT HOIST FOR UNLOCKING			
	Al BO G1 M1 XO IO AO	1.00	30.
9 PULL WIRE AT HOIST FOR SLACK			
	Al BO G1 M1 XO IO AO	1.OO	30.
10 HOLD+REMOVE HOIST FROM HOOK-UP TO SELF			
	AO BO GO Al BO P1 AO	1.OO	20.
11 OPERATE HOIST LEVER +WALK FROM HOOK-UP TO JOB FF 50 (4)			
	Al BO G1 (M6)XO IO A10	1.00	3120.
12 REMOVE LOWER HOIST HOOK FROM JOB TO SELF			
	Al BO G1 Al BO P1 AO	1.OO	40.
13 HOLD+REMOVE HOIST TO TOOLS			
	AO BO GO A6 BO P1 AO	1.OO	70.
	TOTAL TMU		6480 .

17. MOVE 25 TON ON FLAT WITH HYDRAULIC JACK AT GENERAL SHIFFIT {25}
PER OCCURANCE OFG: 4 12-JUN-81
10 OR 25 TON FORTA-POWER JACK
X ATTACHMENTS NOT INCLUDED
X JACK MOVED TO WORKSITE PRIOR
FITTER BEGINS AT JOB

1 GET+PLACE JACK TO JOB (+HOLD HEAD)	A6 BO G3 A6 BO P3 AO	1.OO	180.
2 TURN VALVE AT JACK PUMP	Al BO G1 M3 XO IO AO	1.00	50.
3 OPERATE JACK FOR PUSHING PF 30 (4)	A1 BO G1 (M6)XO IO AO (30)	1.00	1820.
4 TURN VALVE AT JACK AND RETRACT PISTON PT 5 S .	Al BO G1 M3 X16 IO AO	1.00	21O.
5 GET-REMOVE JACK T() TOOLS	Al BO G3 46 BO P1 AO	1.OO	11O.
	TOTAL TMU		2370.

32. INSTALL TIGHT COLLAR ON SIDE SHELL AT SHELL SHOP SHIPFIT
PER EACH OFG: 2 19-JUN-81
TIME INCLUDED TO SCRIBE AND BURN 1 / 4 OF COLLARS
FITTER BEGINS AT TOOLBOX

1 MOVE TOOLTRAY TO FRAME-LINE F 1 / 64	Al BO G1 A67 B6 P1 AO	0.02	12.
2 GET+PICKUP 4 COLLARS TO JOB F 1 / 4	A67 BO G3 A42 BO PO AO	0.25	280.
3 HOLD+TOSS EACH COLLAR TO FRAME-LINE WITHOUT BEND	AO BO GO A3 BO PO AO	1.00	30•
4 MOVE COLLAR WITH BEND TO WEB-FRAME AT FRAME-LINE AND HOLD	A1 B6 G1 Al BO P1 AO	1.00	100.
5 INSPECT 3 POINTS	AO BO GO AO BO PO T3 AO BO PO AO	1.00	30.
6 CLOSE+MOVE COLLAR TO JOB F 1 / 4	AO BO G1 A3 BO P1 AO	0.25	12.
7 MEASURE COLLAR CUT-OUT USING STEEL-TAPE AT FRAME-LINE AND HOLD PF 3 (4 5 6 7) F 1 / 4	A3 B6 G1 (A3 BO P1 M32)AO BO PO AO (3)	0+25	295.
8 MEASURE COLLAR USING STEEL-TAPE AT FRAME-LINE AND ASIDE TO FITTER PF 3 (4 5 6 7) F 1 / 4	A3 B6 G1 (A3 BO P1 M32)Al BO P1 AO (3)	0.25	300.
9 MARK AT COLLAR 2 DIGITS USING MARKER AND ASIDE TO FITTER PF 3 (4 5 6 7) F 1 / 4	Al BO G1 (A1 BO P1 R6)Al BO P1 AO (3)	0.25	70.

10 MEASURE COLLAR USING PROFILE-GAUGE (=SQUARE) AT FRAME-LINE AND ASIDE TO TOOL TRAY PF 3 (456 7)F1/4
A3 B6 G1 (A3 BO P1 M1O)Al BO P1 AO (3) 0.25 135.

11 MARK (=SCRIBE) AT COLLAR 1 DIGIT USING MARKER AND ASIDE TO FITTER P F 3 (4 5 6 7) F 1 / 4
Al RO G1 (Al BO P1 R3)Al BO F1 AO (3) 0.25 48.

12 FULL AND GUIDE TORCH AT BURN-25-PLT PROCESS +3 CUTS F 3 / 4
A32 B6 G1 M1 X42 I3 AO O.75 638 .

13 FASTEN COLLAR 15 TAPS USING SLAG HAMMER AND ASIDE TO TOOLTRAY
A67 B6 G1 A3 BO PO F16 Al BO P1 AO 1.00 950 .

14 CLOSE+PLACE COLLAR TO CUT-OUT IN FRAME-LINE F 1 / 4
AO BO G1 A3 B6 P3 AO 0.25 33.

15 GET+PICKUP TACK-LEAD TO COLLAR
A3 BO G3 A3 B6 PO AO 1.00 150 .

16 HOLD+PUSH TACK-LEAD PROCESS F 4
AO BO GO M1 X42 IO AO 4.00 1720.

17 INSPECT 3 POINTS
AO BO GO AO BO PO T3 AO BO PO AO 1.OO 30.

18 FASTEN COLLAR 3 STRIKES USING HAMMER AND ASIDE
A1 BO G1 Al BO PO F6 A1 BO P1 AO 1.00 110.

19 HOLD+PUSH TACK-LEAD PROCESS F 4
AO BO GO M1 X42 IO AO 4.00 1720.

20 HOLD+MOVE TACK-LEAD TO JOB
AO BO GO A3 BO P1 AO 1.00 40+

21 MARK AT COLLAR 3 DIGITS USING MARKER AND ASIDE TO FITTER
Al BO G1 A3 B6 P1 R10 Al BO P1 AO 1.oo 240.

TOTAL TMU 6942.

34. IGNITE AND EXTINGUISH TORCH FOR BURNING OR HEATING AT HYDE GENERAL SHIPFIT {25}
PER OCCURANCE OFG: 3 25-JUN-81
THIS SEQUENCE FOR SHIPFITTER STANDING BY FOR BURNING OR ENGAGED IN PREHEATING
FITTER BEGINS AT JOB

1 PULL TORCH FROM HOOK-UP TO JOB WITH 15 STEPS			
	A1O BO G1 M1 XO IO A24	1.OO	360.
2 LOOSEN 2 KNOBS ON TORCH AT JOB CLOSE 1 SPIN USING FINGERS			
	Al BO G1 AO BO (P1 L1)AO BO PO AO (2)	1.00	60.
3PRESS STRIKER AT TORCH FOR IGNITING AND CLEAR			
	Al BO G1 M3 XO IO AO	1.OO	50.
4 PULL GOGGLES AT SELF OVER EYES			
	Al BO G1 Ml XO IO AO	1.00	30•
5 TURN KNOB AT TORCH AND ADJUST FLAME F 3			
	Al BO GI H3 XO I6 AO	3.OO	330.
6 HOLD+PLACE TORCH ON TO JOB WITH BEND			
	AO BO GO Al B6 P3 AO	1.OO	100.
7 FASTEN 2 KNOBS AT TORCH CLOSE 1 SPIN USING FINGERS			
	Al BO G1 AO BO (P1 F1)AO BO PO AO (2)	1.00	40.
8 PULL GOGGLES AT SELF OFF EYES			
	Al BO G1 H1 XO IO AO	1.OO	30.
	TOTAL TMU		102O.

53. MARK B/M WITH PENCIL AT SHELL SHOP SHIPFIT
PER PART OFG: 2 10-JUL-81
FITTER BEGINS AT TOOLBOX

1 MOVE B / U PAPERS AND PLANS FROM OFFICE THRU DOOR TO ASSEMBLY PF 2 (2) F 1 / 1 0 0			
	A67 (B16)G1 A67 BO P1 AO (2)	0.01	17.
2 READ AT ASSEMBLY 10 DIGITS ON PART			
	AO BO GO AO BO PO T1O AO BO PO AO	1.00	100.
3 READ AT ASSEMBLY 10 DIGITS ON B/H			
	AO BO GO AO BO PO T1O AO BO PO AO	1.00	100.
4 WRITE ON B / M PAPER 3 DIGITS USING PENCIL AND ASIDE TO FITTER 'S POCKET			
	Al BO G1 Al BO P1 R6 Al BO P1 AO	1.OO	120.
	TOTAL TMU		337.

76. INSTALL NON-TIGHT COLLAR ON BOTTOM SHELL AT LOWER UNIT ASSEMBLY SHOP SHIPFIT

PER EACH OFG: 2 16-JUL-81
FITTER BEGINS AT TOOLBOX

1	MOVE TOOL TRAY TO FRAME-LINE F 1 / 64		
	- Al BO G1 A67 B6 P1 AO	O.O2	12.
2	GET+PICKUF 5 COLLARS TO JOB F 1 / 5		
	A24 BO G3 A24 B6 PO AO	0.20	114.
3	HOLD+TOSS EACH COLLAR TO FRAME-LINE WITHOUT BEND		
	AO BO GO A3 BO PO AO	1.00	30.
4	MOVE COLLAR WITH BEND TO WEB-FRAME AT FRAME-LINE AND HOLD		
	Al B6 G1 Al BO P1 AO	1.OO	1.00
5	FASTEN COLLAR 15 TAPS USING SLAG HAMMER AND ASIDE TO TOOL TRAY		
	Al BO G1 Al BO PO F16 Al BO P1 AO	1.00	210.
6	CLOSE+PLACE COLLAR TO CUT-OUT IN FRAME-LINE		
	AO BO G1 Al BO P3 AO	1.00	50.
7	GET+PICKUP TACK-LEAD TO COLLAR		
	A3 B6 G3 A3 B6 PO AO	1.00	210.
8	HOLD+PUSH TACK-LEAD PROCESS F 4		
	AO BO GO M1 X42 IO AO	4.OO	1720.
9	INSPECT 3 POINTS		
	AO BO GO AO BO PO T3 AO BO PO AO	1.OO	30.
10	FASTEN COLLAR 3 STRIKES USING HAMMER AND ASIDE		
	Al BO G1 Al BO PO F6 Al BO P1 AO	1.OO	110.
11	HOLD+MOVE TACK-LEAD TO JOB		
	AO BO GO A3 B6 P1 AO	1.OO	100.
12	MARK AT COLLAR 3 DIGITS USING MARKER AND ASIDE TO FITTER		
	Al BO G1 A3 B6 P1 R1O Al BO P1 AO	1.00	240.

TOTAL TMU 2926.

114. MAKE UP STIFFENER TIE-BUTT ON BOTTOM SHELL WITH BOLT-ON GOOSENECK, JACK, LUGALL AT LOWER UNIT ASSEMBLY

PER EACH OFG: 3 31-AUG-81

FREQ, JACK = 1 --------FREQ. LUGALL = 1 ,

X FOR TEE BAR OR BUILT-UP WEBS.

FITTER BEGINS AT TOOLBOX

1 MOVE TOOL TRAY TO BUTT F 1 / 16			
	Al BO GI A67 B6 P1 AO	0.06	48.
2 GET+MOVE BOLT-ON GOOSENECK JIG TO TIE BUTT F 1 / 16			
	A173B0 G3 A173B6 P1 AO	0.06	223.
3 MEASURE TEE BAR BUTT USING PROFILE-GAUGE (= SQUARE) AND ASIDE TO TOOLTRAY			
	Al BO G1 A1 BO P1 M1O Al BO P1 AO	1.00	160.
4 LOOSEN 4 BOLTS AT GOOSENECK JIG 6 SPINS USING FINGERS F 2			
Al BO G1 AO BO (P1 Al L10)AO BO PO AO (4)		2.00	1000.
5 HOLD+PLACE GOOSENECK JIG ON TO TEE BAR AT TIE BUTT			
	AO BO GO Al BO P3 AO	1.00	40.
6 FASTEN 4 BOLTS AT GOOSENECK JIG 6 SPINS COMPLEX USING FINGERS F 2			
Al BO GI AO BO (F3 Al F1O)AOBO PO AO (4)		2.00	1160.
7 GET+PICKUP TACK-LEAD TO TEE BAR BUTT			
	A3 B6 G3 A3 B6 PO AO	1.OO	210.
8 HOLD+PUSH TACK-LEAD PROCESS F 5			
	AO BO GO M1 X42 IO AO	5 . O O	2150.
9 HOLD+MOVE TACK-LEAD TO NEXT STRINGER-LINE			
	AO BO GO A3 B6 P1 AO	1.00	100.

TOTAL TMU 5090 .

206. MEASURE AND MARK ASSEMBLY FOR LOCATION OF FOUNDATION OR SMALL TANK

LOWER UNIT ASSEMBLY SHOP SHIPFIT

PER EACH OFG: 2 17-SEP-81

THERE MUST BE SOME TRUE LINE ESTABLISHED PRIOR BY SURVEYORS, F'LANS ARE ALREADY ON THE JOB,

FITTER BEGINS AT TOOLBOX

1 GET+MOVE LEVEL AND TOOLTRAY TO JOB F 1 / 5			
	Al BO G3 A54 B6 P1 AO	().2()	130 .
2 PICKUP PLAN FROM UNIT AND HOLD			
	A24 BO G1 A1 BO PO AO	1.00	260 .
3 READ 20 WORDS F 10			
	AO BO GO AO BO PO T10 AO BO PO AO	10.00	1000.
4 MEASURE JOB LOCATION USING STEEL-TAPE AND HOLD PF 8 (56 7)			
	Al BO G1 A24 (B6 P1 M32)AO BO PO AO (8)	1.00	3380,.
5 MARK AT JOB 2 DIGITS USING MARKER AND ASIDE TO FITTER FF8 (6 7)			
	Al BO G1 Al BO (P1 R6)Al BO P1 AO (8)	1.00	610.
6 PLACE LEVEL TO JOB LAYOUT AND ADJUST PF 4 (4 5 6 7) .			
	Al BO G1 (Al BO F3 Al)	1.00	220.
7 SLIDE MARKER (GUIDE AT LEVEL) F			
	Al BO G1 M3 XO I3 AO	4.00	320.
8 HOLD+MOVE LEVEL TO TOOLTRAY			
	AO BO GO Al BO P1 AO	1.00	20.
7 READ ON PLAN 20 WORDS F 10			
	AO BO GO AO BO PO T10 AO BO PO AO	10.00	1000.
10 MARK JOB WITH PART NUMBERS 6 DIGITS USING MARKER AND ASIDE TO FITTER PF 4 (6 7)			
	A1 BO G1 Al BO (P1 R24)Al BO P1 AO (4)	1.00	105O.
11 PICKUP HAMMER AND PUNCH TO JOB			
	Al BO G1 Al BO PO AO	1.OO	30.
12 HOLD+PLACE PUNCH CLOSE TO JOB LAYOUT F 50			
	AO BO GO Al BO P3 AO	50. 00	2000 .
13 HOLD+FASTEN PUNCH 1 TAP USING HAMMER AND HOLD F 50			
	AO BO GO Al BO PO F1 AO BO PO AO	50.00	1000.
14 HOLD+MOVE HAMMER AND PUNCH TO TOOLTRAY			
	AO BO GO Al BO P1 AO	1.OO	20.

TOTAL TMU 1104O.

289. MOVE PLATE ON PANEL WITH STRONGBACK AT ANY WORK AREA SHIFFIT
PER OCCASION OFG: 2 04-NOV-81
ALL MATERIAL AND EQUIPMENT MOVED TO WORKSITE PRIOR, SEAM IS ALREADY MADE UP
* USE TO IMMOBILIZE SEAMS
* WHEN STUDS ARE.NOT AVAILABLE
FITTER BEGINS AT JOB

1 PICKUF STRONGBACK FROM TOOLS WITH BEND TO JOB			
	A6 B6 G1 A6 B() PO AO	1.00	190.
2 GET+PUSH TACK-LEAD FOR TACKING PROCESS PF 6 (4 5)			
	Al BO G3 (M1 X42)10 AO (6)	1.00	2620 l
3 HOLD+MOVE TACK-LEAD TO JOB			
	AO BO GO Al BO P1 AO	1.00	20•
4 PICKUP SADDLE FROM TOOLS TO JOB			
	A6 BO G1 A6 BO PO AO	1.00	130.0
5 GET+PUSH TACK-LEAD FOR TACKING SADDLE PROCESS PF 2 (4 5)			
	Al BO G3 (M1 X42)I0.AO (2)	1.00	. 900.
6 HOLD+MOVE TACK-LEAD TO JOB			
	AO BO GO Al BO P1 AO	1.00	20•
7 PICKUP HAMMER AND WEDGE TO JOB AND INSERT WEDGE INTO SADDLE FOR STRAIGHTENING BULKHEAD			
	A6 BO G1 A6 BO PO ***Al***	1.00	140.
8 HOLD+FASTEN WEDGE 5 STRIKES USING HAMMER AND HOLD			
	AO BO GO Al BO FO F1O AO BO PO AO	1.OO	110.
9 INSPECT 1 POINT F 2			
	AO BO GO AO BO PO T1 AO BO PO AO	2.00	20.
10 HOLD+FASTEN WEDGE 3 STRIKES USING HAMMER AND ASIDE TO JOB			
	AO BO GO Al BO PO F6 Al BO P1 AO	1.oo	90.
11 LOOSEN WEDGE 3 STRIKES USING HAMMER AND RETURN TO TOOLS			
	Al BO G1 Al BO PO L6 A6 BO P1 AO	1.OO	160.,
	TOTAL TMU		4400 .

290. MAKE UP VERTICAL SEAM IN BULKHEAD WITH DOG 8 WEDGE AT UPPER UNIT ASSEMBLY SHOP SHIPFIT

PER FOOT OFG: 2 04-NOV-81

* FREQ DOG & WEDGE = 1 (LOC # 15)
* FREQ STRONGBACK = 1/2 (LOC #289)
* FREQUENCIES FROM SAMPLES

FITTER BEGINS AT TOOLBOX

1 MOVE TOOLTRAY TO RULKHEAD F 1 / 40	A1 BO G1 A152BO P1 AO	O.O3	39•
2 HOVE DOGS AND WEDGES FROM TOOLBOX TO BULKHEAD F 1 / 10	A15236 G1 A152BO P1 AO	0.10	312.
3 GET+MOVE STRONGRACKS TO BULHEAD F 1 / 10	A152B6 G3 A152110 P1 AO	O.1O	314.
4 GET+PULL WITH 20 STEPS TACK-LEAD FROM WELD-AREA AND CLIMB-STEP TO BULKHEAD WITH 25 STEPS PF 4 (2) F 1 / 20	A32 (B1O)G3 M1 XO IO A42 (4)	0.05	39.
5 SLIDE DOG ACROSS BULKEAD AT BULKHEAD FOR CHECKING ALIGNMENT PF 4 (4)	Al BO G1 (M3)XO IO AO (4)	1.00	140.
6 GET+PUSH TACK-LEAD WITH BEND PROCESS 2 TACKS FOR THAT PART OF WORK WHICH IS WITHIN REACH F 2 / 3	A1 B6 G3 M1 X96 IO AO	0.67	713.
7 GET+PUSH TACK-LEAD WITH CLIMB-OBJECT PROCESS 2 TACKS FOR THAT PART OF WORK WHICH REQUIRES STAGING F 1 / 3	Al B32 G3 M1 X96 IO AO	O.33	443.
8 HOLD+MOVE TACK-LEAD TO ASSEMBLY WITHOUT STEPS	AO BO GO Al BO P1 AO	1.00	20.
	TOTAL TMU		2040.

318. MOVE OPERATOR ON UNIT WITH LADDER AT UNIT ASSEMBLY SHOF'
PER TRIP OFG: 2 01-DEC-81
FOR 16 RUNG LADDER WITHOUT LOAD 60% OF THE TIME.
FITTER BEGINS AT UNIT

1 HOLD+MOVE OPERATOR WITHOUT BURDEN FROM UNIT TO HIGH PART OF ASSEMBLY UP 16 STEP LADDER SIMO 6 F .6			
	AO BO GO A32 B16 <P1>*AO	0.60	288 .
2 HOLD+MOVE OPERATOR WITH BURDEN FROM UNIT TO HIGH PART OF ASSEMBLY UP 16 STEP LADDER SIMO 6 F .4			
	AO BO GO A32 B16 <P1>.AO	0.40	192.
3 PUSH LADDER-RUNG PF 16 (1 2 3 4 5 6 7) F .6			
	(A1 BO G1 H1 XO IO AO)	0.60	288.
4 PRESS LADDER-RUNG PF 16 (1 2 3 4 5 6 7) F .4			
	(Al BO G1 M3 XO IO AO)	0.40	320.
	TOTAL TMU		1088 .

552. MOVE (1 TON) IN (ANY POSITION) WITH HOIST (CABLE LUGALL) AT ANY (WORK AREA) SHIPFIT
PER OCCURANCE OFG: 3 08-FEB-82
ATTACHMENTS INSTALLED PRIOR, LUGALL MOVED TO WORKSITE PRIOR.
FITTER BEGINS AT JOB

1 GET+PLACE HOIST TO JOB AND INSERT LOWER HOOK			
	A6 BO G3 A6 BO P3 Al	1.OO	190.
2 PUSH LOCK AT HOIST			
	Al BO G1 M1 XO IO AO	1.00	30.
3 HOLD+PULL HOIST FROM JOB TO HOOK-UP			
	AO BO GO M1 XO IO A1O	1.00	110.
4 HOLD+PLACE HOIST TO HOOK-UF AND INSERT UPPER HOOK			
	AO BO GO Al BO P3 A1	1.OO	50.
5 OPERATE LEVER AT HOIST FOR MOVING OBJECT PF 30 (4)			
	Al BO G1 (M6)XO IO AO (30)	1.00	1820.
6 PUSH LOCK AT HOIST WITH BEND			
	Al B6 G1 M1 XO IO AO	1.00	90.
7 OPERATE LEVER AT HOIST FOR UNLOCKING PF 4 (4)			
	Al BO G1 (M6)XO IO AO (4)	1.00	260 .
8 PUSH +HOLD LOCK AT HOIST FOR UNLOCKING			
	Al BO G1 M1 XO IO AO	1.OO	30.
9 PULL WIRE AT HOIST FOR SLACK			
	Al BO G1 M1 XO IO AO	1.oo	30.
10 HOLD+REMOVE HOIST FROM HOOK-UP TO SELF			
	AO BO GO Al BO P1 AO	1.OO	20.
11 OPERATE HOIST LEVER +WALK FROMl HOOK-UP TO JOB PF 60 (4)			
	Al BO GI (M6)XO IO A10	1.00	3720.

12 REMOVE LOWER HOIST HOOK FROM JOB TO SELF
A1 BO G1 A1 BO P1 AO 1.OO 40.
13 HOLD+REMOVE HOIST TO TOOLS
AO B0 GO A6 BO P1 AO 1.00 70.

TOTAL TMU 6460.

557. MOVE (SHALL PARTS) FOR ASSEMBLY WITH HAND AT (INVERTED ALUMINUM) UNIT ASSEMBLY SHOP SHIPFIT
PER UP TO 10 PIECES OFG: 2 08-FEB-82
PARTS ARE PRESORTED ON MOCK STORAGE -- MAY BE BUNDLED.
FITTER BEGINS AT UNIT

1 GET+MOVE PARTS WITH CLIMB-STEP FROM MOCK TO UNIT WITH CLIMB-STEF'
A67 B1O G3 A67 B1O P1 AO 1.OO 1580 .

TOTAL TMU 1580.

559. INSTALL COLLAR ON BULKHEAD AT ANY (WORK AREA) SHIPFIT
PER EACH OFG: 3 08-FEB-82
FITTER BEGINS AT JOB

1 MOVE HAMMER TO JOB WITH 1 STEP
A6 BO G1 A3 BO P1 AO 1.00 11O.
2 PLACE COLLAR TO BULKHEAD CUTOUT AND INSERT
Al BO G1 Al EO P3 A1 1.oo 70.
3 INSPECT 3 POINTS
AO BO GO AO BO PO T3 AO EO PO AO 1.00 30.
4 FASTEN COLLAR 3 STRIKES USING HAMMER AND ASIDE TO JOB
Al BO G1 Al B0 PO F6 Al BO P1 AO 1.OO 11O.
5 INSPECT 3 POINTS
AO BO GO AO BO PO T3 AO BO PO AO 1.00 30.
6 MARK AT COLLAR 3 DIGITS (WELD SIZE) USING MARKER AND ASIDE TO FITTER
Al BO G1 Al BO P1 R1O Al BO P1 AO 1.OO 160.

TOTAL TMU 51O.

583 . MAKE READY (FITTER FOR SEAM MAKE-UP) AT FLAT PANEL SHOP (P.L.).SHIFFIT PER EACH OFG: 4 12-APR-82

MOVING ALL PERSONAL GEAR TO SEAM-FIT-GANTRY*USUALLY ONCE P'ER PANEL BLANKET,

* FITTER BEGANS AT OFFICE.
* ALSO INCLUDES GANTRY
* POWER TURN ON/OFF.
* AND RETURN TO TOOLBOX
* AT END OF JOB.

FITTER BEGINS AT OFFICE

1 WAIT 2 M (RECEIVE INSTRUCTIONS BY LEAD PERSON
1.OO 2334 .

2 OPEN COVER AT TOOLBOX PF 2 (3 4) OPEN / CLOSE
A32 BO (G1 M3)XO IO AO (2) 1.00 400.

3 GET+MOVE WITH BEND TOOLBAG AND TOOLTRAY FROM TOOLBOX TO S EAM-FIT-GANTRY WITH CLIMB-STEP PF 2 (5)
Al B6 G3 A196(B10)P1 AO (2) 1.00 2270 .

4 PUSH BUTTON AT SEAM-FIT-GANTRY F 2.PT 1 S AND TURN POWER ON / OFF
Al BO G1 M1 X3 IO AO 2.00 120 .

5 WAIT 5 M AND STUDY BLUEPRINT
1.oo 8335.

6 GET-MOVE TOOLBAG AND TOOLTRAY WITH BEND FROM SEAM-FIT-GANTRY TO TOOLBOX WITH CLIMB-STEP PF 2 (5)
Al B6 G3 A196(B1O)P1 AO (2) 1.00 2270.

7 OPEN COVER AT TOOLBOX PF2 (34) OPEN / CLOSE
A1 BO (G1 M3)XO IO AO (2) 1.00 90.

TOTAL TMU 16819.

584, SET-UP AND TEAR DOWN CLEVIS (GROUND-CLAMP) ON ASSEMBLY (PLATE) AT FLAT PANEL SHOP (P.L.) SHIPFIT

PER EACH OFG: 4 13-APR-82

ALLOWS FITTER TO CHECK ALIGNMENT BEFORE ATTACHING GROUND-CLAMP; AND REMOVAL OF GROUND AFTER SEAM MAKE-UP.

* FITTER STARTS AT GANTRY

FITTER BEGINS AT GANTRY

1 WALK FROM GANTRY TO UNIT WITH 20 STEPS			
	A32 BO Go Ao Bo Po Ao	1.OO	320 .
2 PLACE GROUND-CLAMP FROM GANTRY TO GAHTRY (PLATE EDGE) WITH BEND AND WITHOUT STEPS			
	A16 BO G1 A1 B6 P3 AO	1.00	270.
3 HOLD+FASTEN GROUND-CLAMP WITH 5 WRIST-TURNS USING HAND			
	AO BO GO Al B0 P1 F1O AO BO PO AO	1.OO	120.
4 LOOSEN GROUND-CLAMP WITH 5 WRIST-TURNS USING HAND			
	Al BO G1 Al BO P1 L1O AO BO PO AO	1.00	140.
		TOTAL TMU	850.

585, TRANSP'ORT P'LATE ON POSITIONER WITH MAGNET (CRANE) AT FLAT PANEL SHOP (P.L.) SHIPFIT

PER EACH OFG: 4 13-APR-132

1ST PLATE FOR EACH P'ANEL BLANKET.

* TO LAND 1ST PLATE ONLY.

FITTER BEGINS AT UNIT

1 WALK FROM UNIT TO GANTRY WITH 6 STEPS			
	A1O BO GO AO BO PO AO	1.OO	1.00
2 WAIT 45 S WHILE CRANE TRANSFORMS PLATE FROM GRIND-PREP AREA TO SEAM-FIT-AREA			
		1.00	1251 .
3 FULL HANDLE AT GANTRY PT 30 S AND DISPLACE PLATE 10 FT. BY CONVEYOR			
	Al BO G1 Ml X81 IO AO	1.oo	640.
4 WALK FROM GANTRY TO UNIT WITH 6 STEPS			
	A1O BO GO AO BO PO AO	1.oo	100.
		TOTAL TMU	2291.

586. ALIGN PLATE ON P0SITIONER WITH MAGNET AT FLAT PANEL SHOP (P.L.) SHIPFIT

PER EACH OFG: 4 12-APR-82
PLATE EDGE GROUND PRIOR BY D-39. ONE PLATE OR MADE-UP PANELS ALREADY IN POSITION,
* THIS SUB-OF FOR 2ND FLATE
* OF ANY BLANKET MAKE-UP.
* ASSUME PLATE WITHIN 61N.
* OF ALIGNMENT POSITION.
FITTER BEGINS AT GANTRY

1 WAIT 45 S WHILE CRANE TRANSFORMS FLATE FROM GRIND-FREF AREA TO SEAM -FIT-GANTRY AREA		1.OO	1251 .
2 FULL HANDLE AT GANTRY AND BEND+STAND PT 30 S (DISPLACE PLATE 10 FT. BY CONVEYOR)	Al B16 G1 M1 X81 IO AO	1.OO	1000.
3 FITTER WALK TO UNIT WITH 4 STEPS	A6 BO GO AO BO PO AO	1.00	60•
4 MEASURE PLATE AT UNIT WITH BEND USING STEEL-TAFE AND HOLD	Al BO G1 Al BO P1 M32 AO BO PO AO	1.00	360.
5 HOLD+MOVE STEEL-TAPE TO UNIT EDGE WITH 3 STEPS AND BEND	AO B0 GO A6 B6 P1 AO	1.00	130.
6 HOLD-PRESS STEEL-TAPE FROM UNIT TO FITTER	AO BO GO M3 XO IO Al	1.OO	40.
7 MANIPULATE STOP AT UNIT WITH 4 STEPS AND CLIMB-STEP AND RETURN TO GANTRY WITH 16 STEPS AND CLIMB-STEF PF 4 (1 2 3 4)	(A6 B1O G1 M1O)XO IO A32 B1O	1.00	1500.
8 PUSH BUTTON AT GANTRY WITH BEND+SIT FIT 3 S PF 4 (34 5) LINE PLATE UP-TO END STOPS	A1 B6 (G1 M1 X10)10 AO (4)	1.00	550 l
9 PUSH BUTTON AT GANTRY PT 3 S F 4 LINE FLATE UP-TO SIDE ROLLS	Al BO G1 M1 X1O IO AO	4.OO	520.
10 PUSH BUTTON AT GANTRY F 2 PT 3 S LINE-UP LEVELING TABLE	Al BO G1 M1 X1O IO AO	2.OO	260.
	TOTAL TMU		5571 .

537. TACK PLATE ON POSITIONER WITH SEMIAUTOMATIC AT FLAT PANEL SHOP (P.L.)
SHIPFIT
PER EACH OFG: 4 13-APR-82
POSITION JACKS TO WELD 1ST TACK.
* FITTER AT GANTRY (PLATE
* EDGE),
* METHOD ONLY FOR 1ST TACK+
FITTER BEGINS AT GANTRY

1 WALK FROM GANTRY (PLATE EDGE) TO GANTRY (JACKS) WITH 3 STEPS			
	A6 BO GO Ao BO Po Ao	1.00	60.
2 PUSH BUTTON AT GANTRY FIT 1.5 S AND ENGAGE JACKS			
	A1 BO G1 Ml X3 IO AO	1.00	60.
3 PLACE SEMIAUTOMATIC FROM WEB WITHOUT STEPS TO GANTRY WITH KNEEL SIMO			
	<A1 BO G1 Al)B16 P3 AO>	1.00	0.
4 lNSPECT 5 POINTS			
	AO BO GO AO BO PO T6 AO HO PO AO	1.00	60.
5 MOVE HOOD FROM TOOL-BAG WITHOUT STEPS TO FITTER WITH 3 STEPS			
	Al BO G1 AA HO Pl AO	1.00	90.
5 PULL HO0D AT FITTER			
	Al BO G1 Ml XO IO AO	1.00	30.
7 PRESS SEMIAUTOMATIC AT GANTRY FT 6 S			
	A1 BO G1 M3 X16 IO AO	1.00	210.
8 PUSH HOOD AT FITTER			
	Al BO G1 M1 XO IO AO	1.00	30.
9 PRESS BUTTON AT GANTRY F 12 / 14 PT 6.5 S JACKS RELEASE AND TRAVERSE 14 IN, THEN REENGAGE			
	Al BO G1 M3 X16 IO AO	0+86	180.

TOTAL TMU 720 .

588, MAKE UP SEAM ON POSITIONER WITH JACK AND MAGNETS AT FLAT PANEL SHOP
(P.L.) SHIPFIT
PER EACH OFG: 4 13-APR-82
PLATES POSITIONED PRIOR TO MAKE UP,
* FITTER BREGINS AT SEAM.
* METHOD FOR 1 FT. OF SEAM.
* FITTER BEGINS WITH PRESS
* ENGAGED AND WELDING HOOD
* ON.
FITTER BEGINS AT GANTRY

1	GET+PLACE SEMIAUTOMATIC FROM WEB WITHOUT STEPS TO GANTRY Al BO G3 A1 BO P3 AO	1.00	80,
2	INSPECT 3 POINTS AO BO GO AO BO PO T3 AO BO PO AO	1.00	30,
3	MOVE HOOD FROM TOOL-BAG TO FITTER SIMO <A16B0 G1 A16 BO P1 AO >	1.00	0.
4	PULL HOOD AT FITTER A1 BO G1 M1 XO IO AO	1.00	30.
5	PRESS SEMIAUTOMATIC AT GANTRY PT 6 S A1 BO G1 M3 X16 IO AO	1.00	210.
6	PUSH HOOD AT FITTER A1 BO G1 M1 XO 10 AO	1.00	30.
7	PRESS BUTTON AT GANTRY F 12 / 14 PT 6.5 S JACKS RELEASE AND TRAVERSE 14 IN. THEN REENGAGE Al BO G1 M3 X16 IO AO	0.86	180.

TOTAL TMU 560.

(609, MARK (LAYOUT LINE) ON DECK (PLATE) WITH (HAMMER AND) F'UNCH AT ANY (WORK AREA) SHIPFIT

PER FOOT OFG: 1 15-NW-82

LINES ARE MARKED PRIOR WITH CHALKLINE

* ASSUMES FITTER MUST CHANGE POSITION

* BY CRAWLING ON KNEES ALONG LAYOUT LINE

FITTER BEGINS AT UNIT

1 HAVE TOOLTRAY FROM UNIT TO STIFFENER SIMO			
	<A1 B0 G1 A10 B0 P1 A0 >	1.00	0.
2 PICKUF HAMMER AND CENTER PUNCH TO FITTER WITH BEND F 1 / 40			
	Al H0 G1 Al B6 F0 A0	0.03	2.
3 HOLD+FUSH AND GUIDE FUNCH F 2			
	A0 B0 G0 Ml X0 13 A0	2.00	80.
4 HOLD+FASTEN FUNCH 1 STRIKE USING HAMMER AND HOLD F 2			
	A0 B0 G0 Al E0 P0 F3 A0 E0 F0 A0	2.OO	80.
5 MOVE HAMMER AND FUNCH TO STIFFENER WITH PBEND F .5 SIMO (1 3)			
	<AI>B0 <G1>A1 B3 P1 A0	0.50	25.
6 HOLD+MOVE HAMMER AND.PUNCH TO TOOLTRAY F 1 /' 40			
	A0 80 GO Al D0 F1 A0	0*03	0.
		TOTAL TMU	188.

610, MARK PLATE WITH CHALKLINE AT ANY PANEL SHOP SHIFFIT

PER FOOT OFG: 3 19-APR-82

TWO MAN OPERATION, BOTH BEGIN AT JOB, METHOD DEVELOPED FROM 20 FOOT, OPERATION,

* REVS. BASED ON 61N.
* PER RERACTION.
* FITTER AND HELPER
* HAVE CHALKLINE AT
* STIFFENER,
* TMU'S MUST BE DOUBLED
* FOR SECOND OPERATOR.

FITTER BEGINS AT STIFFENER

1 HELPER MOVE TOOLTRAY FROM UNIT TO STIFFENER SIMO			
	<A1 B0 G1 A10 E10 P1 A0 >	1.00	0.
2 HELPER MOVE CHALKLINE FROM TOOLTRAY TO SELF F 1 / 20			
	Al B0 G1 Al B0 P1 A.0	0.05	2.
3 FITTER FULL CHALKLINE FROM HELPER TO UNIT WITH 8STEPS F1 / 20			
	Al B0 G1 M1 X0 I0 A10	0.05	7.
4 FITTER PRESS CHALKLINE WITH BEND AND LOCATE F 1 / 20			
	Al B6 G1 M3 X0 I1 A0	0.05	6.
5 HELPER PRESS CHALKLINE WITH BEND AND LOCATE SIMO			
	<A10B6 G1 M3 X0 I1 A0 >	1.00	0.
6 FITTER PRESS CHALKLINE AT UNIT AND SNAP LINE F 1 / 20			
	A1 B0 G1 M3 X0 I0 A0	0.05	2.
7 FITTER CRANK CHALKLINE 21 REVS F 2 / 20			
	Al B0 G1 M32 X0 I0 A0	0.10	34.
	TOTAL TMU		51.

(611, MARK ASSEMBLY WITH MARKER AT ANY LAYOUT AREA SHIPFIT
PER EACH OFG: 3 19-APR-82
THIS SUB-OP MARKS ONE POINT AFTER ANY MEASURING DEVICE HAS BEEN POSITIONED
* TYPICAL SINGLE POINT
* LAYOUT,
FITTER BEGINS AT UNIT

1 FITTER WALK FROM UNIT TO WEB WITHOUT STEPS AND WITH PBENU			
	Al B3 GO A0 B0 F0 A0	1.00	40.
2 HAVE MARKER FROM TOIILTRAY TO FITTER AND HOLD SIMO			
	<A10B0 G1 A10 B0 F1 A0 >	1.OO	0.
3 HOLD+MARK ON WEB 1 DIGITS USING MARKER AND HOLD			
	A0 E10 G0 A1 E0 P1 R3 A0 B0 P0 A0	1.00	50.
		TOTAL TMU	90.

612, ARRANGE TAPE ON ASSEMBLY AT ANY LAYOUT AREA SHIFFIT
PER FOOT OFG: 3 19-APR-82
THIS SUB-OF ALLOWS FULLING OUT TAPE AND RETRACTION. SUB-OF FOR 50 FT. METHOD, INCLUDING ALIGNMENT OF TAPE.
* SPRING-CLAMF USED TO
* HOLD TAPE,
FITTER BEGINS AT TOOLBOX

1 MOVE LONGTAPE FROM TOOLBOX TO TOOLTRAY SIMO			
	<A1 E0 G1 Al B0 F1 A0 >	1.00	0.
2 MOVE CLAMP FROM TOOLCRIB TO TOOLTRAY SIMO			
	<A152E0 G1 A152B0 P1 A0 >	1.OO	0.
3 MOVE TOOLTRAY FROM TOOLBOX TO STIF-FIT SIMO			
	<A1 H0 G1 A113B0 F1 A0 >	1.00	0.
4 HAVE LONGTAPE AND CLAMP FROM TOOLTRAY TO FITTER F 1 / 50			
	A1 H0 G1 Al B0 P1 A0	0.02	1.
5 FULL LONGTAPE AT STIF-FIT AND HOLD F 1 / 50			
	A1 B0 G1 M1 X0 I0 A0	0.02	1.
6 PRESS AND GUIDE LONGTAPE AT STIF-FIT WITH BEND F 1 / 50			
	A1 B6 G1 M3 X0 I3 A0	0.02	3.
7 OPEN+SHUT CLAMF ON TAPE AT STIF-FIT F 2 / 50			
	A1 B0 G1 M6 X0 I0 A0	0.04	3.
8 FITTER WALK FROM STIF-FIT TO STIF-FIT WITH 20 STEPS AND WITH BEND F 1 / 5 0			
	A32 B6 G0 A0 B0 P0 A0	0.02	8.
9 FITTER CRANK LONGTAPE 21 REVS F 4 / 50 (WHILE WALKING)			
	A1 E10 G1 M32 X0 I0 A0	0.08	27 .
10 MOVE LONGTAPE AND CLAMP FROM FITTER TO TOOLTRAY F 1 / 50			
	A1 B0 G1 A1 B0 F1 A0	0.02	1.

TOTAL TMU 43.

613. MAKE-UP SEAM ON POSITIONER WITH SHIM (PLATE) AT FLAT PANEL SHOP (P.L.)
SHIP'FIT
PER FOOT OFG: 2 22-APR-82
THIS PROCESS USED WITH PLATES THAT ARE LESS THAN .375 IN.
* METHOD DEVELOPED
* FROM 30 FT, SEAM.
* SHIM-F'LATE AT UNIT.
* SHIM IS 10'X8'X,750' PLT.
FITTER BEGINS AT UNIT

1 GET+MOVE SHIM-PLATE FROM UNIT TO GANTRY AND HOLD			
	Al B0 G3 A16 B0 P1 A0	1.00	210.
2 GET+PRESS SHIM-PLATE AT GANTRY WITH BEND F 1 / 30 SIMD 1 3			
	<Al>B6 <G3>M3 X0 I0 A0	0.03	3.
3 PLACE SEMIAUTOMATIC FROM WEB TO GANTRY SIMO			
	<A1 B0 G1 A1 B0 P3 A0 >	1.00	0.
4 HAVE SEMIAUTOMATIC FROM GANTRY TO FITTER F 2			
	Al B0 G1 A1 80 P1 A0	2.00	80.
3 GET+SLIDE SHIM-PLATE AT GANTRY			
	Al B0 G3 M3 X0 I0 A0 >	1.00	70.
6 GET+PLACE SHIM-PLATE FROM GANTRY TO UNIT F 1 / 30			
	Al B0 G3 A16 B0 P3 A0	0.03	8.

TOTAL TMU 371.

614. MOVE (OPERATOR) ON ASSEMBLY AT ANY LAYOUT AREA SHIPFIT
PER FOOT OFG: 2 l9-APR-82
THIS SUB-OP ALLOWS OPERATOR TO MOVE 1 FOOT. BASED ON 20 FOOT WALK.
* TYPICAL 30 IN, STEP,
FITTER BEGINS AT UNIT

1 FITTER WALK FROM UNIT TO WEB WITH 8 STEPS F 1 / 20			
	A16 E0 G0 A0 B0 P0 A0	0.05	8.

TOTAL TMU 8.

617. MOVE TOOL (LUG-ALL) WITH HANDl TO FLAT PANEL SHOP (SEAM-FIT) SHIPIFIT
PER SHIFT OFG: 4 30-APR-82
THIS SUB-OP COVERS GETTING THE CUM-A-LONG AND RETURNING IT.
FITTER BEGINS AT SEAM-FIT-GANTRY

1 MOVE LUG-ALL FROM TOOLCRIB TO SEAM-FIT-GANTRY			
	A270B0 G1 A270B0 P1 A0	1.00	5420.
2 MOVE LUG-ALL FROM SEAM-FIT-GANTRY TO TOOLCRIB			
	Al B0 G1 A270B0 P1 A0	1.00	2730.
	TOTAL TMU		8150.

618. TRANSPORT OPERATOR ON POSITIONER AT FLAT PANEL SHOP SHIPFIT
PER EACH OFG: 3 04-MAY-82
COVERS GANTRY CHAIR MOVEMENT AT THE RATE OF ,67SEC. / FT. (181N. / SEC.) . BASED ON 30FT. TRAVEL
* FITTER ON UNIT.
* CHAIR MOVED AFTER
* EACH SEAM.
FITTER BEGINS AT UNIT

1 WALK FROM UNIT TO GANTRY WITH 4 STEPS F 1 / 30			
	A6 B0 G0 A0 80 P0 A0	0.03	2.
2 PULL HANDLE AT GANTRY PF 20 T PF 30 (5 6 7) F 1 / 30			
	Al H0 G1 M1 (X3 IO A0)	0.03	31.
	TOTAL TMU		3 3

650. MEASURE DECK FOR (BUTTOCK LINE) WITH (SURVEYORS) AT ANY UNIT ASSEMBLY SHOP SHIPFIT
PER EACH OFG:-4 25-MAY-82
SURVEYORS FIND C.L. AND MASTER FRAME LINE OF PANELo THEN SET O.B. EDGE ,
* TWO SURVEYORS FOR JOB.
* THEY DO C.L. AND MASTER FRAME
* AND BOTH O.B. EDGES.
* THIS SUB-OF FOR 1 EDGE.
FITTER BEGINS AT UNIT

1 WALK TO OFFICE AND CALL URVEYORS.			
	A81 B0 G0 A0 B0 P0 A0	1.00	810.
2 WAIT 15 MIN FOR SURVEYORS ARRIVAL			
		1.00	25005 .
3 WALK TO UNIT SIMIO			
	<A81B0 GO A0 B0 F0 A0 >	1.00	O.
4 WAIT 15 MIN FOR SURVEYORS TO SET UP			
		1.00	25005.
5 WAIT 15 MIN FOR SURVEYORS TO READ TRANSIT			
		1.00	25005.
6 READ 50 WORDS F 20 FOR DATA TRANSFER			
	A0 B0 G0 A0 B0 F0 T24 A0 E0 F0 A0	20.00	4800.
		TOTAL TMU	80625.

673, ADJUST (BUDDA JACK) ON DECK WITH HAND AT ANY (WORK AREA) SHIPFIT
PER EACH OFG: 3 27-MAY-82
COVERS PLACING BUDDA JACK AND SMALL BLOCKING, BLOCKING AND JACK OBTAINED PRIOR. SEE SUB-OF 619 FOR JACK USE.
* ALLOWS ARMS REACH DISPLACEMENT
FITTER BEGINS AT UNIT

1 MOVE JACK AND BLOCKING FROM TOOLCRIB TO HOUSE-SIDE SIMO			
	<A330B0 G1 A427R0 F1 A >	1.00	0.
2 GET+SLIDE AND GUIDE JACK AT HOUSE-SIDE WITH PBEND			
	Al B3 G3 H3 X0 13 A0	1.00	130.
3 PLACE BLOCKING FROM HOUSE-SIDE TO JACK WITH PBEND			
	Al B0 G1 Al B3 F3 A0	1.00	90.
4 REPLACE BLOCKING FROM JACK TO HOUSE-SIDE WITH PBEND			
	Al B0 G1 Al B3 F3 A0	1.00	90.
		TOTAL TMU	310.

690. MEASURE (AND MARK) BRACKET FOR (TRIMMING) WITH STEEL TAPE AT. (INVERTED ALUMINUM) UNIT ASSEMBLY SHOP SHIPFIT

PER EACH OFG: 3 26-MAY-82

FITTER FINDS BRACKET IS USABLE WITH MINOR TRIM.

FITTER BEGINS AT HOUSE-SIDE

1	MOVE WEB FROM FRAME-LINE TO HOUSE-SIDE SIMO <A16B4 G1 A16 B0 P1 A0 >	1.00	0.
2	MOVE TOOLTRAY FROM TOOLBOX TO HOUSE-SIDE SIMO <A113B6 G1 A113B0 P1 A0 >	1.00	0.
3	MOVE BRACKET FROM UNIT TO WEB SIMO <A16B0 G1 A16 B0 P1 A0 >	1.00	0.
4	INSPECT 8 POINTS A0 B0 G0 A0 B0 P0 T1O A0 B0 P0 A0	1.00	100.
5	MEASURE BRACKET USING STEEL-TAPE AND ASIDE TO FITTER A1 B0 G1 Al B0 P1 M32 A1 B0 P1 A0	1.00	380.
6	GET+PLACE BRACKET FROM WEB TO HOUSE-SIDE A1 B0 G3 A1 B0 P3 A0	1.00	80.
7	MEASURE BRACKET USING STEEL-TAPE AND ASIDE TO FITTER A1 B0 G1 A1 B0 P1 M32 A1 E0 P1 A0	1.00	380.
8	MARK BRACKET 2 DIGITS USING MARKER AND ASIDE TO FITTER PF 2 (4 5 6 7.) Al B0 G1 (A1 N0 P1 R6)A1 B0 P1 A0 (2)	1.00	200.
9	MEASURE BRACKET USING PROFILE-GAUGE (SQUARE) AND ASIDE TO TOOLTRAY P F 2 (6 7) Al B0 G1 Al B0 (P1 M10)A1 H0 F1 A0 (2)	1.00	270.+

TOTAL TMU 1410.

692. INSTALL BRACKET ON (HOUSE SIDE) AT (INVERTED ALUMINUM) UNIT ASSEMBLY SHOP SHIPFIT
PER EACH OFG: 3 28-MAY-82
BRACKET MOVED PRIOR BY SUE-OP 557 AND ON JOB,
* TACKING COVERED BY SUR-OP 524,
FITTER BEGINS AT HOUSE-SIDE

1	MOVE BRACKET FROM UNIT TO HOUSE-SIDE SIMO <A16B0 G1 A16 B0 P1 A0 >	1.00	0.
2	MOVE WEB FROM FRAME-LINE TO HOUSE-SIDE SIMO <A16R6 G1 A16 B0 P1 A0 >	1.00	0.
3	MOVE TOOLTRAY FROM TOOLBOX TO HOUSE-SIDE SIMO <A113B6 G1 A113B0 P1 A0 >	1.00	0.
4	GET+POSITION BRACKET TO WEB AT HOUSE-SIDE WITH BEND A1 B0 G3 Al B6 P6 A0	1.00	170.
5	INSPECT 8 POINTS A0 E0 G0 A0 R0 P0 T10 A0 B0 P0 A0	1.00	100.
6	PICKUP HAMMER TO FITTER A1 B0 G1 A1 B0 F0 A0	1.00	30.
7	HOLD+FASTEN BRACKET 3 TAPS USING HAMMER AND ASIDE TO TOOLTRAY A0 B0 G0 A1 E10 P0 F3 Al B0 P1 A0	1.OO	60.
8	INSPECT 8 POINTS A0 B0 G0 A0 B0 P0 T10 A0 B0 F0 A0	1.00	100.

TOTAL TMU 460.

703. MOVE (OPERATOR) ON ASSEMBLY WITH (BEND) Al ANY (WORK AREA) SHIPFIT
PER EACH OFG: 3 02-JUN-82
THIS SUB-OF DESCRIBES A BODY MOTION IN A COMB, SUB-OF THAT HAS NOT BEEN COVERED IN THE INHERENT SUB-OPS,
FITTER BEGINS AT UNIT

1	HOLD+TOSS OBJECT FROM UNIT TO UNIT WITH BEND SIMO (4) A0 B0 G0 <A1>.B6 F0 A0	1.00	150.

TOTAL TMU 60.

704. MOVE (OPERATOR) ON ASSEMBLY WITH (KNEEL) AT ANY (WORK AREA) SHIPFIT
PER EACH OFG: 3 02-JUN-82
THIS SUE-OP DESCRIBES A BODY MOTION IN A COMB. SUE-OP THAT HAS NOT BEEN COUERED IN THE INHERENT SUB-OP.
FITTER BEGINS AT UNIT

1 HOLD+TOSS OBJECT FROM UNIT TO UNIT WITH KNEEL SIMO (4)				
	A0 B0 G0 <A1>B16 P0 A0		1.00	160.
		TOTAL TMU		160.

705. MOVE (OPERATOR) ON ASSEMBLY WITH (CLIMB-OBJECT) AT ANY (WORK AREA) SHIPFIT
PER EACH OFG: 3 02-JUN-82
THIS SUB-OP DESCRIBES A BODY MOTION IN A COME. SUB-OP THAT IS NOT IN THE INHERENT SUB-OPS.
FITTER BEGINS AT UNIT

1 HOLD+TOSS OBJECT FROM UNIT TO UNIT WITH CLIME-OBJECT SIMO (4)				
	A0 B0 G0 <A1>B32 PO 40		1.00	320.
		TOTAL TMU		320.

709. INSTALL (TOE) BRACKET WITH JIG AT ANY (WORK AREA) SHIPFIT
PER EACH OFG: 2 04-JUN-82
COVERS THE INSTALLATION OF ONE TOE BRACKET.
* FOR PIECES < 8' IN LENGTH.
FITTER BEGINS AT UNIT

1 MOVE JIG FOR TOE-BRACKET FROM TOOLCRIB TO UNIT SIMO			
	<A330B0 G1 A330B0 P1 A0 >	1.00	0.
2 PICKUP JIG AND BRACKET TO FITTER WITH PBEND			
	A1 B0 G1 Al B3 P0 A0	1.00	60.
3 HOLD+MOVE BRACKET TO JIG AND INSERT			
	A0 B0 G0 Al B0 P1 Al	1.00	30.
4 HOLD+PLACE JIG FROM FITTER TO BULKHEAD STIFFENER WITH 1 STEP AND KNEEL			
	A0 B0 GO A3 B16 P3 A0	1.000	220.
5 INSPECT 3 POINTS FOR ALIGNMENT			
	A0 B0 G0 A0 B0 P0 T3 A0 B0 P0 A0	1.00	30.
6 SLIDE JIG AT BULKHEAD STIFFENER FOR REMOVAL			
	A1 B0 G1 M3 X0 I0 A0	1.00	50.
	TOTAL TMU		390.

721. MARK ASSEMBLY FOR FOUNDATION (LOCATION) AT ANY (WORK AREA) SHIPFIT
PER EACH LA OFG: 3 07-JUN-82
FOR FLAT LOCATION E.G. STRAIGHT DECK
FITTER BEGINS AT UNIT

1 MOVE TOOLTRAY AND LEVEL TO UNIT SIMO			
	<A152B6 G1 A152B0 F1 A0 >	1.00	0.
2 MOUE PAPERS FROM OFFICE TO MOCK SIMO			
	<A81B0 G1 A270B3 F1 A0 >	1.00	0.
3 MOVE PAPERS FROM MOCK TO UNIT WITH CLIMB-OBJECT			
	Al B0 G1 A67 B32 P1 A0	1.00	1020.
4 OPEN PLAN PAPER F 2			
	Al B0 G1 M3 X0 I0 A0	2.00	100.
5 READ AT UNIT 20 WORDS ON PLAN F 10			
	A0 B0 G0 A0 B0 F0 T10 A0 B0 P0 A0	10.00	1000.
6 WALK FROM UNIT TO UNIT (FOUNDATION LOCATION) WITH 12 STEPS			
	A24 B0 G0 A0 B0 P0 A0	1.00	240.
7 PICKUF STEEL-TAPE AND LEVEL TO FITTER AND KNEEL FOR MEASURING PROCESS			
	Al B0 G1 A1 B16 F0 A0	1.00	190.
8 HOLD+MEASURE AT UNIT USING STEEL-TAFE AND HOLD PF 6 (4 56 7)			
	A0 B0 G0 (A1 B0 F1 M32)A0 B0 F0 A0 (6)	1.00	2040.
9 MARK AT UNIT 2 DIGITS WITH 2 STEPS AND BEND USING MARKER AND ASIDE TO FITTER PF 6 (451578)			

Al B0 G1 (Al B0 P1 R6 A1)B0 P1 A0 (6) 1.00 570.

10 MEASURE AT UNIT USING PROFILE-GAUGE (= LEVEL) AND ASIDE PF 4 (6 7)

A1 B0 G1 A1 E0 (P1 M1O)A1 E0 P1 A0 (4) 1.00 490.

11 MARK AT UNIT 2 DIGITS USING MARKER AND ASIDE TO FITTER (=SCRIBE AGAINST LEVEL) PF 6 (67)

Al B0 G1 A1 B0 (P1 R6)A1 B0 P1 A0 (6) 1.00 470.

TOTAL TMU 6120.

739. MEASURE HEADER ON UNIT WITH (ADJUSTABLE) JIG AT (INVERTED ALUMINUM) UNIT ASSEMBLY SHOP SHIPFIT

PER EACH OFG: 3 08-JUN-82

MARK HEADER FOR CUT AT BANDSAW. JIG IS SHOWN IN BIW HANDBOOK OF JIGS AND FIXTURES.

FITTER BEGINS AT FRAME-LINE

1 MOVE TOOLTRAY TO FRAME-LINE SIMO

<A67B5 G1 A67 B6 P1 A0 > 1.00 0.

2 MOVE JIG TO FRAME-LINE SIMO

<A393B0 G1 A393B6 P1 A0 > 1.00 0.

3 PRESS AND LOCATE JIG AT FRAME-LINE WITH KNEEL

A1 B16 G1 M3 X0 I1 A0 1.00 220.

4 LOOSEN 4 NUTS ON JIG.AT FRAME-LINE 2 WRIST-TURNS USING HAND PF 2 (1 2 3)

(Al B0 G1)A0 B0 (Pl A1 L6)A0 B0 P0 A0 (4) 1.00 360.

5 CLOSE+SLIDE AND ADJUST JIG AT FRAME-LINE FOR LENGTH AND ANGLE F 2

A0 B0 G1 M3 X0 I6 A0 2.00 200.

6 FASTEN 4 NUTS ON JIG AT FRAME-LINE 2 WRIST-TUENS USING HAND PF 2 (1 2 3)

(A1 B0 G1)A0 B0 (P1 A1 F6)A0 B0 P0 A0 (4) 1.00 360,

7 GET+PLACE JIG FROM FRAME-LINE LOCATION TO FRAME-LINE HEADER WITH 1 STEP AND REND

Al B0 G3 A3 B6 F3 A0 1.00 160.

8 MARK AT FRAME-LINE 1 DIGIT USING MARKER AND ASIDE TO FITTER PF 20 (6 7) [=ALL MARKING NEEDED FOR SCRIBE]

A1 B0 G1 Al B0 (Pl R3)A1 B0 P1 A0 (20) 1.00 850.

9 MOVE SQUARE TO FRAME-LINE HEADER AND HOLD F 2

A1 B0 G1 A1 B0 F1 A0 2.00 80.

10 HOLD+SLIDE AND GUIDE SQUARE F 2

A0 B0 G0 M3 X0 I3 A0 2.00 120.

11 HOLD+MOVE SQUARE TO TOOLTRAY

A0 B0 G0 A1 B0 F1 A0 1.00 20.

TOTAL TMU 2370.

740. ALIGN HEADER ON ASSEMBLY AT (INVERTED ALUMINUM) UNIT ASSEMBLY SHOP SHIPFIT
PER EACH OFG: 3 08-JUN-82
THIS SUB-OP ALLOWS FITTER TO SET HEADER PRIOR TO TACKING. SCRIBE DONE PRIOR.
* ALUMINUM HEADER
FITTER BEGINS AT FRAME-LINE

1	GET+PLACE HEADER FROM FRAME-LINE TO FRAME-LINE WITH 1 STEP AND BEND A1 B0 G3 A3 B6 P3 A0	1.00	160.
2	SLIDE AND ALIGN+ACCURATE HEADER AT FRAME-LINE WITH BEND Al B6 G1 M3 X0 I16 A0	1.00	270.
3	MOVE TOOLTRAY AND LEVEL FROM TOOLBOX TO FRAME-LINE SIMO <A67B6 G1 A67 B6 P1 A0 >	1.00	0.
4	INSPECT 8 POINTS F 4 A0 B0 G0 A0 B0 P0 P0 A0 B0 P0 A0	4.00	400.
5	FASTEN HEADER AT FRAME-LINE 3 STRIKES USING HAMMER AND HOLD F 3 A1 B0 G1 Al B0 P0 F6 A0 B0 P0 A0	3.00	270.
6	HOLD+M0VE HAMMER TO TOOLTRAY A0 B0 G0 A1 B0 P1 A0	1.00	20.

TOTAL TMU 1120.

782 + TACK (STEEL) ON ASSEMBLY WITH SMAW (1/8 7018) AT ANY (SHOP) SHIPFIT
PER FOOT OFG: 2
FREQ, BY 1/12 PER INCH, INCLUDES SET-UP TIME AND TIME TO PLACE ROD AND CLOSE/OPEN HOOD+ PTIS, 1-AI-1/8... PT1S, 1A7018F000,

1 1 1/8 FLAT FILLET 134TMU/IN. ARC TIME.

TOTAL TMU 2599.

783 + TACK (STEEL) ON /ASSEMBLY WITH SMAW (1/8 6011) AT ANY (SHOP) SHIPFIT
PER EACH FOOT OFG: 2
FREQ. BY 1/12 PER INCH. PTIS, 1-AI-1/8...PTlS.1A15011A000. INCLUDES SET-UP, ROD PLACEMENT AND HOOD ADJUSTMENT.

1 1 1/8 FLAT FILLET 201TMU/IN, ARC TIME.

TOTAL TMU 4360.

784. TACK (STEEL) ON ASSEMBLY WITH SEMIAUTOMATIC AT ANY (SHOP) SHIPFIT
PER EACH FOOT OFG: 2
INCLUDES SET-UP, WIRE CHANGE, HOOD PLACEMENT,
FTIS.1-AI-1/8...FLUXCORE TACK.

1 1 1/8 FLAT FILLET, FLUXCORE SEMIAUTOMATIC

TOTAL TMU 1472.

786. MOVE (KICKERS) FOR (STIFFENERS) WITH HAND AT FLAT (P.L.) PANEL SHOP SHIPFIT
PER 5 SETS OF KICKERS (10 PIECES) OFG: 3 02-AUG-82
METHOD DOUBLED TO COVER RETURNING KICKERS TO STORAGE,
* KICKERS ARE SIZED FOR STIFFENERS
FITTER BEGINS AT PANEL

1 GET+MOVE TOOLTRAY WITH BEND FROM TOOLBOX TO LONGITUDINAL WITH BEND F

A113B6 G3 A113B6 P1 A0 2.00 4840.

2 MOVE KICKERS FROM TOOLTRAY TO FRAME-LINE WITH PBEND PF 5 (4 5 6) F

A1 B0 G1 (A3 B3 P1)A0 (5) 2.00 740.

TOTAL TMU 5580.

787. REMOVE (TEMPORARY) ATTACHMENT FOR (STIFFENER) AT FLAT (P.L.) PANEL SHOP SHIPFIT
PER EACH KICKER SET (2 PIECES) OFG: .2 02-AUG-82
METHOD TO PICKUP KICKERS TO A CARRIER FOR REMOVAL FROM UNIT, DOES NOT ACCOUNT FOR BURNING AND GRINDING.
* 1 BEND PER 2 PIECES,
FITTER BEGINS AT FRAME-LINE

1	MOVE TOOLTRY TO FRAME-LINE SIMO <A113B0 G1 A113B0 F1 A0 >.	1.00	0.
2	PICKUP KICKER FROM FRAME-LINE TO FITTER WITH BEND PF 2 (1 2 3) (A1 E0 G1)A1 B6 F0 A0 (2)	1.00	110.
3	MOVE KICKER FROM FITTER TO TOOLTRAY Al B0 G1 A1 B0 P1 A0	1.00	40.
4	WALK 1 STEP TO LONGITUDINAL A3 B0 G0 A0 B0 P0 A0	1.00	30.
		TOTAL TMU	180.

788. TRANSPORT RACK WITH (CRANE) TO FLAT (P.L.) PANEL SHOP SHIPFIT
PER EACH LIFT OFG: 4 02-AUG-82
METHOD ALLOWS HOOK-UP, TRANSPORT AND UNHOOKING, DOES NOT USE MOST CRANE PARAMETERS,
* CRANE OPERATOR IN PLACE, HIS METHOD
* NOT ADDRESSSED.
FITTER BEGINS AT PANEL

1	GET+SLIDE PORT-STEPS AT 2DOOR FOR RACK ACCESS A1311B0 G3 M3 X0 I0 A01	1.00	1370.
2	WALK TO RACK AT 2DOOR WITH 4 STEPS AND LADDER FOR GETTING ON HORSES A6 B16 G0 A0 B0 P0 A0	1.00	220.
3	PLACE HOOK FROM 2DOOR TO RACK WITH BEND AND 5 STEPS F 4 A1 B0 G1 A10 B6 P3 A0	4.00	840.
4	WAIT 103 S FOR CRANE REACHING LAYOUT - FITTER MOVES SIMO	1.00	2863.
5	REPLACE HOOK FROM RACK TO LAYOUT WITH BEND AND 5 STEPS F 4 Al B0 G1 A10 B6 P3 A0	4.00	840.
		TOTAL TMU	6133.

789. TRANSPORT STIFFENER FOR (PANEL) UNIT WITH (MAGNET-CRANE) AT FLAT (F.L.)
PANEL SHOP SHIPFIT
PER EACH STIFFENER OFG: 3 02-AUG-82
METHOD ALLOWS LOAD-OUT USING MAGNET-CRANE, FITTERS ALIGN STIFFENERS AND DIRECT CRANE OPERATOR. 2 FITTERS USUALLY.1
* CRANE TRAVEL 50% FASTER THAN GANTRY.
* FITTERS FEEL CRANE IS SAFER.`
FITTER BEGINS AT PANEL

1 MOVE STIFFENER TO RACK SIMO <410B0 G1 A131B0 P1 A0 >	1.00	0.
2 MOVE RACK TO LAYOUT SIMO <Al B0 G1 A113B0 P1 A0 >	1.00	0.
3 WAIT 7 S FOR MAGNET TO ATTACH AND LIFT STIFFENER	1.00	194.
4 WAIT 19 S FOR MAGNET TO BRING STIFFENER TO KICKERS ABT 25 FT.	1.00	528.
5 WAIT 14 S FOR DROP - FITTERS ALIGN SIMULTANEOUSLY	1.00	389.
6 WAIT 19 S FOR RELEASE AND RETURN TO RACK	1.00	528.
TOTAL TMU		1639.

790. MAKE READY OPERATOR (FITTER) FOR (WORK SHIFT) AT FLAT (F.L.) PANEL SHOP SHIFFIT

PER EACH SHIFT OFG: 4 03-AUG-82

MOVING ALL PERSONAL GEAR TO STIFFENER GANTRY.

* FITTER BEGINS AT TOOLBOX. GETS TOOLTRAY

* AND RETURNS TO TOOLBOX AT END OF SHIFT.

FITTER BEGINS AT TOOLBOX

1 WAIT 2 M FOR INSTRUCTIONS BY LEAD PERSON		1.00	3334.
2 OPEN COVER AT TOOLBOX WITH BEND FOR OPEN / CLOSE OPERATION PF 2 (3)			
	Al B6 (G1 M3)X0 I0 A0 (2)	1.00	150.
3 GET+MOVE TOOLTRAY TO PANEL WITH BEND			
	Al B0 G3 A113B6 F1 A0	1.00	1240.
4 WAIT 5 M AND STUDY SKETCH		1.00	8335.
5 GETMOVE WITH BEND TOOLTRAY TO TOOLBOX			
	A1 B6 G3 A113B0 F1 A0	1.00	1240.
6 OPEN COVER AT TOOLBOX WITH BEND PF 2 (34)			
	Al B6 (G1 M3)X0 I0 A0 (2)	1.00	150.
7 PLACE TOOLTRAY TO TOOLBOX			
	A1 B0 G1 A1 B0 P3 A0	1.00	60.
	TOTAL TMU		14509.

793. ALIGN STIFFENER ON (PANEL) UNIT WITH (SLEDGE) HAMMER AT FLAT (P.L.)
PANEL SHOP SHIPFIT
PER EACH STIFFENER OFG: 2 03-AUG-82
METHOD USED WHEN GANTRY NOT AVAILABLE. ONLY NEEDED FOR HEAVY STIFFENERS. ONLY ALIGNS TO PLATE EDGE.
* PRIOR LOAD-OUT BY CRANE.
FITTER BEGINS AT FRAME-LINE

1 MOVE TOOLTRAY TO FRAME-LINE SIMO			
	<A113B0 G1 A113B0 P1 A0>	1.00	0.
2 FASTEN STIFFENER 6 STRIKES USING HAMMER AND HOLD			
	A1 B G1 A1 B0 P0 F16 A0 E0 P0 A0	1.00	190.
3 PLACE LEVEL TO STIFFENER WITH BEND F 2			
	A1 B0 G1 A1 B6 F3 A0	2.00	240.
4 INSPECT 4 POINTS FOR CHECKING ALIGNMENT F 2			
	A0 B0 G0 A0 B0 P0 T6 A0 B0 P0 A0	2.00	120.
5 HOLD+FASTEN STIFFENER 2 STRIKES USING HAMMER AND ASIDE TO TOOLTRAY			
	A0 B0 G0 A1 B0 P0 F6 A1 B0 P1 A0	1.00	90.
A PLACE OEGEE-BAR WITH BEND FROM FRAME-LINE TO STIFFENER			
	A1 B6 G1 A1 B0 F3 A0	1.00	120.
7 HOLD+PRESS OEGEE-BAR AT FRAME-LINE FOR FLUMBING			
	A0 B0 G0 M3 X0 I0 A0	1.00	30.
8 REMOVE OEGEE-BAR FROM STIFFENER TO FRAME-LINE			
	A1 B0 G1 A1 B0 P1 A0	1.000	40.
	TOTAL TMU		830.

796. MAKE UP STIFFENER ON (PANEL) UNIT WITH (GANTRY) AT FLAT (P.L.) PANEL
SHOP SHIPFIT
PER EACH 10 FT. OF STIFFENER OFG: 2 04-AUG-82
METHOD FOR ALIGNING AND TACKING,
* GANTRY IN PLACE,
* STIFFENERS LOADED OUT PRIOR.
FITTER BEGINS AT PANEL

1 MOVE GANTRY TO FRAME-LINE SIMO			
	<A1 B0 G1 A10 E0 P1 A0 >	1.00	0.
2 WALK TO RAM AT FRAME-LINE WITH 12 STEPS			
	A24 B0 G0 A0 B0 F0 A0	1.00	240.
3 PUSH BUTTON ON GANTRY AND TRAVEL RAM 40 FT, FOR ACQUIRING STARTING POINT PT 32 S			
	A1 B0 G1 M1 X96 I0 A0	1.00	990.
4 PUSH BUTTON ON GANTRY FOR ENGAGING MAGNETS 1 FT, PT 3.36 S F 2			
	A1 B0 G1 M1 X10 I0 A0	2.00	260.
5 PUSH BUTTON ON GANTRY FOR ENGAGING RAM 3 IN. PT 2.31 S F 2			
	A1 B0 G1 M1 X6 I0 A0	2.00	180.
6 INSPECT 3 POINTS F 2			
	A0 B0 G0 A0 B0 P0 T3 A0 B0 F0 A0	2.00	60.
7 WALK TO FRAME-LINE WITH 0 STEPS AND BEND F 2			
	A1 B6 G0 A0 B0 F0 A0	2.00	140.
8 TURN BUTTON ON GANTRY FOR ALIGNING AGAINST LINE F 2			
	A1 B0 G1 M3 X0 I0 A0	2.00	100.
9 FULL BUTTONS ON GANTRY FOR RELEASING RAM. AND MAGNETS 3 IN. PT 3 S F 2			
	A1 B0 G1 M1 X10 I0 A0	2.00	260.
10 PUSH BUTTON ON GANTRY AND TRAVEL RAM 10 FT. PT 8 S			
	A1 B0 G1 M1 X24 I0 A0	1.00	270.
	TOTAL TMU		2500.

797. POSITION (GANTRY) ON (PANEL) UNIT AT FLAT (L+) PANEL SHOP SHIPFIT
PER EACH STIFFENER OFG: 3 04-AUG-82
METHOD FOR POSITIONING GANTRY TO STIFFENER.
* CONTROLLED FROM MAIN PANEL.
FITTER BEGINS AT PANEL

1 WALK TO GANTRY WITH 12 STEPS AND CLIMB-OBJECT			
A24 B32 G0 A0 E0 P0 A0	1.00	560.
2 PRESS BUTTON FOR RELEASING BAR			
Al B0 GI M3 X0 I0 A0	1.00	50.
3 PUSH HANDLE AND HOLD FOR 6 IN. RELEASE MOVE PT .5 S			
Al B0 G1 M1 X1 I0 A0	1.00	40.
4 HOLD+PUSH HANDLE AND HOLD FOR RAISING MAGNETS 18 IN. PT 6 3			
A0 80 G0 M1 X16 I1 A0	1.00	170.
5 HOLD+PULL HANDLE AND HOLD FOR TRAVELING 30 IN. PT 2.5 S			
A0 B0 G0 M1 X6 I0 A0	1.00	70.
6 HOLD+PUSH HANDLE AND HOLD FOR LOWERING MAGNETS 18 IN. PT 6 S			
A0 R0 G0 M1 X16 I0 A0	1.00	170.
7 HOLD+PULL HANDLE FOR 6 IN. ENGAGE MOVE PT .5 S			
A0 B0 G0 M1 X1 I0 A0	1.00	20.
8 PUSH BUTTON FOR ENGAGING BAR			
Al B0 G1 H1 X0 I0 A0	1.00	30.
9 PRESS BUTTON FOR ALIGNING AGAINST END			
Al B0 G1 M3 X0 I0 A0	1.00	50.
10 PUSH BUTTON FOR SETTING STOPS F 2			
Al B0 G1 H1 X0 I0 A0	2.00	60.
	TOTAL TMU	1220.

603. MOVE TOOL TO FLAT (P.L.) PANEL SHOP SHIPFIT
PER EACH MOVE FROM TOOLCRIB OFG: 4 1O-AUG-82
METHOD ALLOWS FITTER TO BRING AN ISSUED TOOL FROM THE TOOLCRIB TO THE STIFFENER FITTING GANTRY AND TO RETURN IT.
* USED TO DESCRIBE ANY COMPANY TOOL0
FITTER BEGINS AT PANEL

1	GET+MOVE TOOL FROM TOOLCRIB TO PANEL WITH PBEND A173B0 G3 A173B3 F1 A0	1.00	3530.
2	WAIT 15 S FOR FILLING OUT FORM	1.00	417.
3	GET+MOVE WITH PBEND TOOL FROM PANEL TO TOOLCRIB AND RETURN TO PANEL A1 B3 G3 A17380 P1 A173	1.00	3540.
4	WAIT 15 S FOR TOOLKEEPER CHECKING RECORDS	1.00	417.
	TOTAL TMU		7904.

841. TRANSPORT OBJECT FOR ASSEMBLY WITH (AUXILIARY FALL) AT OVERHEAD (CRANE) (P.L.) PANEL SHOP SHIPFIT
PER EACH VERTICAL LIFT > 10 FT. OFG: 3 18-AUG-82
METHOD FOR SOUTHERN-MOST 100 TONNER'S WHIP IN VERTICAL DIRECTION.
FALL SFEED IS 1 FT / SEC.
* INCLUDES HOOK AND UNHOOK. CRANE-DOG ON
* CHAIN, DOUBLE HOOK,
* FOR SIMPLICITY: HELPER = RIGGER.
* TRAVEL COVERED ELSEWHERE.
HELPER BEGINS AT LONGITUDINAL

1	PLACE CRAME-DOG FROM HELPER TO FLOOR-MAGNET F 2 A1 B0 G1 A1 B0 F3 A0	2.00	120.
2	SHUT CRANE-DOG AT FLOOR-MAGNET FOR LOCKING F 2 A1 B0 G1 M3 X0 I0 A0	2.00	100.
3	INSPECT 3 POINTS FOR CHECKING DOG F 2 A0 B0 G0 A0 B0 P0 T3 A0 B0 P0 A0	2.00	6 0
4	INSPECT 6 POINTS FOR LOOKING FOR OPERATOR A0 B0 G0 A0 B0 F0 T10 A0 B0 P0 A0	1.00	100.
5	WAIT 5 S FOR SIGNALING OPERATOR	1.00	139..
6	PUSH BUTTON WITH O STEPS FOR OPERATOR'S OPERATION A1 R0 G1 H1 X0 I0 A0	1.00	30.
7	WAIT 11 S FOR LIFTING FLOOR-MAGNET 3 FEET	1.00	305.
8	8 WAIT 11 S FOR LOWERING FLOOR-MAGNET 3 FEET	1.00	305.
9	OPEN WITH O STEPS CRANE-DOG AT FLOOR-MAGNET F 2		

A1 B0 G1 M3 X0 I0 A0 2.00 100.
10 GET+PLACE CRANE-DOG FROM FLOOR-MAGNET TO HELPER WITH O STEPS F 2
Al B0 G3 A1 B0 P3 A0 2.00 160.
11 WAIT 5 S FOR REMOVING CRANE
1.00 139.

TOTAL TMU 1558.

845. TRANSPORT OBJECT FOR ASSEMBLY WITH (AUXILIARY FALL) AT OVERHEAD (CRANE) (P.L.) PANEL SHOP SHIPFIT
PER EACH LIFT OFG: 3 18-AUG-82
METHOD FOR SOUTHERN-HOST 100 TONNER'S WHIP IN HORIZONTAL DIRECTION, HOVE BETWEEN 50 & 100 FT. DIAGONAL TRAVEL = 3.75 FT. / SEC.
* ONLY COVERS HORIZONTAL, VERTICAL COVERED
* ELSEWHERE,
HELPER BEGINS AT LONGITUDINAL

1 WAIT 20 S FOR TRAVEL
1.00 556.

TOTAL TMU 556.

848. POSITION (OVERHEAD CRANE) ON UNIT WITH WINCH (FALL) AT OVERHEAD (CRANE) (P.L.) PANEL SHOP SHIPFIT
PER EACH CRANE USE OFG: 3 18-AUG-82
METHOD ALLOWS FITTER TO GET RIGGER WHO SIGNALS & BRINGS TO WORK AREA. METHOD USED WITH ANY CRANE.
* FITTER RETURNS TO WORK AREA PRIOR TO
* CRANE AND IS WORKING UNTIL CRANE ARRIVAL
FITTER BEGINS AT PANEL

1 WALK TO 2DOOR FOR CALLING RIGGER F .5
A131B0 GO A0 B0 P0 A0 O.5O 655.
2 WALK TO PANEL FOR RETURNING F *5
A131B0 GO A0 B0 P0 A0 0.50 655.
3 WAIT 6 S FOR LOWERING FALL
1.00 166.

TOTAL TMU 1476.

852. TRANSPORT STIFFENER FOR (PANEL) UNIT WITH (MAGNET-CRANE) AT FLAT (P.L.)
PANEL SHOP SHIPFIT
PER EACH LOAD OF 8 FFG STIFFENERS, OFG: 3 19-AUG-82
METHOD ALLOWS LOAD-OUT USING MAGNET-CRANE, FITTERS MUST PUSH STIFFENERS TO LAYOUT POSITION. 2 FITTERS USUALLY.
* CRANE PICKS UP ALL STIFFENERS SIMO,
* STIFFENERS RACKED IN ORDER AT HARDINGS,
FITTER BEGINS AT PANEL

1 MOVE STIFFENER TO RACK SIMO	<A10B0 G1 A131B0 P1 A0 >	1.00	0.
2 MOVE RACK TO LAYOUT SIMO	<A1 B0 G1 4113B0 P1 A0>	1.00	0.
3 WAIT 7 S FOR MAGNET ATTACHING ONTO STIFFENER5		1.00	194.
4 WAIT 19 S FOR MAGNET BRINGING STIFFENERS OVER LOCATION		1.00	528.
5 WAIT 7 S FOR DROP AND CRANE REMOVAL		1.00	194.
6 GET+POSITION AND GUIDE STIFFENER TO FRAME-LINE WITH 3 STEPS AND CRAWL F 8	A1 B0 G3 A32 B0 P6 A0 B24	8.00	5280.
	TOTAL TMU		6196.

853. POSITION STIFFENER FOR (PANEL) UNIT WITH (OEGEE-BAR) AT FLAT (P.L.)
PANEL SHOP SHIPFIT
PER EACH FFG STIFFENER OFG: 3 19-AUG-82
METHOD USED TO STAND UP STIFFENER. 2 FITTERS - 1 USES OEGEE-BAR : OTHER ALIGNS,
* TACKING DONE WITH MWELD SUB-OP FOR 6011.
* NO KICKERS NEEDED.
FITTER BEGINS AT FRAME-LINE

1 PICKUP OEGEE-BAR FROM FRAME-LINE TO FITTER WITH BEND			
	A1 B0 G1 A1 B6 P0 A0	1.00	90.
2 PUSH WITH BEND OEGEE-BAR AT STIFFENER			
	A1 B6 G1 M1 X0 I0 A0	1.00	90.
3 HANDLE OEGEE-BAR AT STIFFENER FOR LIFTING UPRIGHT			
	Al B0 G1 M6 X0 I0 A0	1.00	80.
4 HOME TOOLTRAY TO FRAME-LINE SIMO			
	<A113B0 G1 A113B0 P1 A1 >	1.00	0.
5 FASTEN STIFFENER 3 STRIKES USING HAMMER AND ASIDE TO TOOLTRAY FOR. ALIGNING			
	A1 B0 G1 A1 B0 F0 F6 A1 B0 P1 A0	1.00	11O.
6 INSPECT 3 POINTS			
	A0 B0 G0 40 80 PO T3 A0 B0 P0 A0	1.00	30.
7 REMOVE OEGEE-BAR FROM STIFFENER TO LONGITUDINAL WITH BEND			
	A1 B0 G1 A3 B6 P1 A0	1.00	120.
	TOTAL TMU		520.

879. MARK PLATE WITH MARKER AT ANY LAYOUT AREA SHIPFIT
PER EACH PIECE MARK OFG: 2 01-SEF-82
METHOD INVOLVES READING SKETCH AND HARKING CODE AT ONE LOCATION.
* ONE LETTER, DASH, 3 NUMBERS USER FOR
* FIECE ID NUMBER.
FITTER BEGINS AT LAYOUT

1 READ ON SKETCH 4 DIGITS			
	A0 B0 G0 A0 B0 P0 T6 A0 B0 P0 A0	1.00	60.
2 WALK TO LAYOUT WITH O STEPS AND PBEND			
	A1 B3 G0 A0 B0 P0 A0	1.00	40.
3 MARK ON PLATE AT LAYOUT 5 DIGITS USING MARKER AND ASIDE			
	A1 B0 G1 A1 B0 P1 R16 A1 B0 P1 40	1.00	220.
	TOTAL TMU		320.

941. MARK (PANEL) FOR WEB FRAME WITH STRAIGHTEDGE AT FLAT (P.L.) PANEL SHOP SHIPFIT
PER FOOT OF WEB OFG: 2 09-SEP-82
PANEL LAYOUT IS DONE PRIOR, THIS OPERATION IS FOR REMARKING EXISTING LINES,
BASED ON 30 INCH SPACING,
FITTER BEGINS AT LONGITUDINAL

1 PICKUP STRAIGHTEDGE FROM LONGITUDINAL TO FRAME-LINE F 12 / 30
A1 B0 G1 A3 B0 P0 A0 0.40 20.
2 PRESS AND ADJUST STRAIGHTEDGE AT FRAME-LINE WITH KNEEL PF 2 (4 5 A) F 1 2 / 3 0
A1 B16 G1 (M3 X0 16)A0 (2) 0.40 144.
3 SLIDE AND GUIDE MARKER ALONG STRAIGHTEDGE AT FRAME-LINE FOR MARKING P F 2 (1 2 3 4 5 6) F l 2 / 3 0
(A1 B0 G1 M3 X0 I3)A0 (2) 0.40 64.

TOTAL TMU 228.

944. UNLOAD WEB FRAME FOR (PANEL) ASSEMBLY WITH HAND AT FLAT (P.L.) PANEL SHOP SHIPFIT
PER WEB OFG: 2 09-SEP-82
METHOD ALLOWS FITTER TO AID RIGGER WHILE LANDING WEBS.
* FITTER ALIGNS WEB SIMO TO CRANE SET,
FITTER BEGINS AT FRAME-LINE

1 MANIPULATE AND ALIGN WEB AT FRAME-LINE WITH PBEND
A1 B3 G1 M10 X0 I10 A0 1.00 250.
2 INSPECT 9 POINTS
A0 B0 G0 A0 B0 P0 T10 A0 B0 P0 A0 1.00 100.
3 WALK FROM FRAME-LINE TO PANEL WITH 8 STEPS FOR INSPECTING
A16 B0 G0 A0 B0 P0 A0 1.00 160.

TOTAL TMU 510.

948. ALIGN BRACKET FOR WEB FRAME AT FLAT (P.L.) PANEL SHOP SHIPFIT
PER WEB CUTOUT OFG: 2 15-SEF-82
METHOD USED IN CONJUNCTION WITH PLUMBING OPERATION AND IS USED TO CLOSE TANKER BKTS, AND F.B. TO STIFFENER FOR TIGHT WELD.
* BKTS, DONE BY LUG-ALL AND FLAT BAR BY
* JACK AND DOG, FREQ, 5 F.B. TO 3 BKTS.
FITTER BEGINS AT LONGITUDINAL

1 WALK FROM LONGITUDINAL TO FRAME-LINE WITH FBEND F 2			
A3 B3 G0 A0 B0 F0 A0	2.OO	120.
2 INSPECT 3 POINTS F 2			
A0 B0 G0 A0 B0 F0 T3 A0 B0 F0 A0	2.00	60.
3 MOVE LUG-ALL FROM TOOLTRAY TO FRAME-LINE FOR USE SIMO			
<A113B0 G1 Ai13B0 P1 A0 >	1.00	0.
4 MOVE JACK&KICKER FROM TOOLTRAY TO FRAME-LINE FOR USE SIMO			
<A113B0 G1 A113B0 F1 A0 >	1.00	0.
5 MOVE LEAD TO FRAME-LINE FOR TACKING SIMO			
<A3 BO G1 A3 B0 F1 A0 >	1.00.	0.
	TOTAL TMU	180.

949 . ALIGN (BY PLUMBING) WEB FRAME ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT
PER WEB CUTOUT OFG: 2 15-SEP-82
METHOD ALLOWS FLUMBING WITH LUG-ALL AND CHECK WITH LARGE SQUARE. FREQ. TO SQUARE STIFFENER IN CUTOUT.
* FREQ. FOR 1 LUG-ALL USE AND INSPECTION.
* SIMO FREQ, USED FOR METHOD CLARITY.
FITTER BEGINS AT LONGITUDINAL

1 MOVE TOOLTRAY TO LONGITUDINAL SIMO			
<A113B0 GI A113B0 F1 A0 >	1.00	0.
2 PLACE SQUARE FROM TOOLTRAY TO FRAME-LINE F 2 FOR CHECKING SQUARENESS			
Al B0 G1 A3 B0 F3 A0	2.00	160.
3 INSPECT 5 POINTS			
A0 B0 G0 A0 B0 P0 T6 A0 B0 P0 A0	1.OO	60.
4 MOVE LUG-ALL FROM TOOLTRAY TO FRAME-LINE FOR LUG-ALL USE SIMO			
<A3 B0 G1 A3 B0 P1 A0 >	1.00	0.
5 INSPECT 5 POINTS			
A0 B0 G0 A0 B0 F0 T6 A0 B0 P0 A0	1.OO	60.
6 REMOVE SQUARE FROM FRAME-LINE TO TOOLTRAY			
A1 B0 G1 A3 B0 P1 A.	1.00	60.
7 MOVE JACK&KICKER FROM TOOLTRAY TO FRAME-LINE FOR USE SIMO			
<A1 B0 G1 A3 B0 F1 A0 >	1.00	0.
8 MOVE LEAD FROM TOOLTRAY TO FRAME-LINE FOR TWO TACKS SIMO			
<A3 B0 G1 A3 B0 P1 A0 >	1.00	0.

TOTAL TMU 340.

950, MAKE UP WEB FRAME ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT
PER WEB CUTOUT OFG: 2 15-SEP-82
METHOD ALLOWS USING A LUG-ALL TO FULL WEB TO LAYOUT LINE BETWEEN TWO STIFFENERS,
* FREQ, FOR 2 LUG-ALL USES; ONCE AT
* EACH CUTOUT.
* DUMMY FREQ. FOR METHOD CLARITY.
FITTER BEGINS AT LONGITUDINAL

1 MOVE TOOLTRAY TO LONGITUDINAL SIMO
<A113B0 G1 A113B0 P1 A0 > 1.00 0.
2 MOVE HAMMER TO FRAME-LINE WITH KNEEL
A1 B0 G1 A3 B16 P1 A0 1.00 220.
3 INSPECT 3 POINTS
A0 B0 G0 A0 B0 P0 T3 A0 R0 F0 A0 1.00 30.
4 MOVE LUG-ALL FROM TOOLTRAY TO FRAME-LINE FOR 1ST 0PERATION SIMO
<A3 BO G1 B3 B0 P1 A0 > 1.00 0.
5 INSPECT 3 POINTS
A0 B0 G0 A0 B0 P0 T3 A0 B0 F0 A0 1.00 30.
6 HAVE LEAD FROM TOOLTRAY TO FRAME-LINE FOR TACKING SIMO
<A3 B0 G1 A3 B0 F1 A0 > 1.00 0.
7 MOVE LUG-ALL FROM TOOLTRAY TO FRAME-LINE FOR 2ND LUG-ALL USE SIMO
<A3 B0 GI A3 B0 F1 A0 > 1.00 0.
8 INSPECT 3 POINTS
A0 B0 G0 A0 B0 P0 T3 A0 B0 F0 A0 1.00 30.
9 FASTEN WEB AT FRAME-LINE 2 STRIKES USING HAMMER AND ASIDE FOR ALIGNING MIDDLE OF FLAT
Al B0 G1 A1 B0 PO F6 A1 B0 P1 A0 1.00 110.
10 MOVE LEAD FROM FRAME-LINE TO LONGITUDINAL FOR TACKING SIMO
< A1 B0 G1 A3 B0 P1 A0 > 1.00 0.
11 MOVE DOGWEDGE FROM TOOLTRAY TO FRAME-LINE FOR USE SIMO
<A1 B0 G1 A3 B0 F1 A0 > 1.00 0.
12 MOVE BOLT&CLIP FROM TOOLTRAY TO FRAME-LINE FOR USE SIMO
<A3 B0 G1 A3 B0 P1 A0 > 1.00 0.

TOTAL TMU 420.

952 FLAME CUT (STEEL) FOR (BURNING PROCESS) WITH TORCH AT ANY (WORK AREA)
SHIPFIT
PER 12 INCHES OFG: 2
HAND BURNING BASED ON SUB-OF 951 AND MWELD OPERATIONS
BURN-A-l/8Xl/2...PL...BURN-A-8, OBSERVED CUTTING SPEED OF 8.5 IN./MIN.

1 IGNITE TORCH; MAKE BURN; EXTINGUISH TORCH; DESLAG, OPERATION DOES NOT ALLOW BURNER SET-UP OR GETTING TORCH TO JOB,

TOTAL TMU 5004.

1019. MOVE WEB FRAME ON (PANEL) UNIT WITH (KING WEB) CLAMP AT FLAT (P.L.)
PANEL SHOP SHIPFIT
PER EACH FFG CUT-OUT OFG: 2 22-SEP-82
METHOD FOR OPERATING A BIW DEVICE USED FOR TIGHTENING WEBS TO PANELS USING STIFFENERS FOR PULLING POINTS.
* CLAMP HAS 'ICE TONG' JAWS AND LARGE
* SCREW FOR TIGHTENING.
FITTER BEGINS AT LONGITUDINAL

1 MOVE WITH BEND CLAMP FROM LONGITUDINAL TO FRAME-LINE WITH BEND
A1 B6 G1 A3 B6 P1 A0 1.OO 180.
2 OPEN+SHUT AND GUIDE CLAMP-JAWS AT FRAME-LINEFOR HOOKING ONTO STIFFENER F 2
Al E0 G1 M6 X0 13 A0 2.00 220
3 SLIDE CLAMP AT FRAME-LINE FOR FLACING TENSION ONTO JAWS
Al B0 G1 M3 X0 I0 A0 1.00 50.
4 FASTEN CLAMP AT FRAME-LINE 10 WRIST-TURNS USING HAND FOR INCREASING TENSION
A1 B0 G1 Al B0 P1 F24 A0 B0 F0 A0 1.00 280.
5 MOUE TOOLTRAY TO FRAME-LINE SIMO
<A113B0 G1 A113B0 F1 AO > 1.00 0.
6 FASTEN CLAMP AT FRAME-LINE 5 ARM-STROKES USING WRENCH AND ASIDE TO TOOLTRAY
Al B0 G1 Al BO F3 F32 Al B0 P1 A0 1.00 400.
7 LOOSEN CLAMP AT FRAME-LINE 3 ARM-STROKES USING WRENCH AND ASIDE TO TOOLTRAY
Al B0 G1 Al B0 P3 L16 A1 B0 P1 A0 1.00 240.
8 LOOSEN CLAMP AT FRAHE-LINE 12 WRIST-TURNS USING HAND
Al B0 G1 Al B0 P1 L24 A0 B0 P0 A0 1.00 280.
9 OPEN CLAMP-JAWS AT FRAME-LINE FOR REMOVAL F 2
Al B0 G1 M3 X0 I0 A0 2.00 100.
10 MOVE CLAMP FROM FRAME-LINE TO TOOLTRAY
A1 B0 G1 A1 B0 P1 A0 1.00 40.

TOTAL TMU 1790,

1020, INSPECT CUTOUT ON WEB FRAME WITH SQUARE AT FLAT (P.L.) PANEL SHOP SHIPFIT
PER EACH FFG CUTOUT OFG: 2 22-SEP-82
METHOD USED BECAUSE OF VARIATIONS IN LONGITUDINAL HEIGHTS DUE TO MILL SPEC ALLOWANCES, SOME CUTOUTS NEED TO BE TRIMMED, FREQ. 0.33.
* CHECK ALL CUTOUTS, BURN 0.33
FITTER BEGINS AT LONGITUDINAL

1	MOUE TOOLTRAY TO LONGITUDINAL SIMO			
	<A113B0 B0 G1 A113B0 P1 A0 >	1.00	0.
2	MEASURE WITH BEND STIFFENER USING PROFILE-GAUGE AT FRAME-LINE AND HOLD			
	A3 B6 G1 A1 B0 P1 M10 A0 B0 P0 A0	1.00	220.
3	HOLD+FLACE PROFILE-GAUGE FROM FITTER TO (WEB-FRAME AT LONGITUDINAL WITH PBEND AND HOLD			
	A0 B0 G0 A3 B3 P3 A0	1.00	90.
4	PICKUP MARKER TO FITTER F .33			
	Al B0 G1 A1 B0 P0 A0	0.33	10.
5	HOLD+OPERATE PROFILE-GAUGE AT LONGITUDINAL AND HOLD F 1.33			
	A0 B0 G0 M6 X0 I0 A0	1.33	80.
6	SLIDE MARKER ON PROFILE-GAUGE AT LONGITUDINAL AND HOLD SIHO			
	<A1 B0 G1 M3 X0 I0 A0 >	1.00	0.
7	MARK ON WEB-FRAME AT LONGITUDINAL 2 DIGITS USING MARKER AND ASIDE TO FITTER FOR RADIUS CORNERS F .33			
	Al B0 G1 A1 B0 P1 R6 A1 B0 F1 A0	0.33	40.
8	MOVE PROFILE-GAUGE FROM FITTER TO TOOLTRAY			
	Al B0 G1 A1 B0 P1 A0	1.00	40.

TOTAL TMU 479.

1021. MAKE UP WEB FRAME (FLAT) ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT
PER FFG CUTOUT OFG: 2 22-SEP-82
METHOD USED TO MAKE UP FLATS BETWEEN STIFFENERS AND BASED ON 18 IN, FRAME SFACING.
* MAKE UP WITH KING CLAMP AND HAMMER,
FITTER BEGINS AT LONGITUDINAL

1	MOVE KING-CLAMP FROM LONGITUDINAL TO STIFFENER FOR TIGHTENING OPERATION SIMO <Al R0 G1 A3 B0 P1 A0 >	1.00	0.
2	MOVE TOOLTRAY TO FRAME-LINE SIMO <A113B0 G1 A1131B0 P1 A0 >	1.00	0.
3	FASTEN WEB-FRAME AT FRAME-LINE 3 STRIKES USING HAMMER AND ASIDE TO TOOLTRAY F 2 A1 R0 G1 A1 B0 P0 F6 A1 B0 P1 **AO**	2.00	220.
4	INSPECT 3 POINTS F2 A0 B0 G0 A0 B0 P0 T3 A0 R0 F0 AO	1.00	30.
5	INSPECT 3 POINTS A0 B0 G0 A0 B0 F0 T3 A0 B0 F0 AO	1.00	30.
6	MOVE BOLT&CLIP FROM TOOLTRAY TO STIFFENER FOR FULLING TOGETHER SIMO <A1 B0 G1 A1 B0 P1 A0 >	1.00	0.
7	MOVE DOG&WEDGE FROM TOOLTRAY TO STIFFENER FOR ALIGNING SIMO <A1 B0 G1 A1 B0 P1 AO >	1.00	0.
	TOTAL TMU		280.

115. COMBINED SUB-OF

MAKE UP STIFFENER TIE-BUTT WITH BOLT-ON GOOSENECK & JACK AT LOWER UNIT ASSEMBLY SHOP SHIPFIT
THE GOOSENECK USED IN THIS METHOD IS DETAILED IN BIW BOOK OF JIGS & FI XTURES ,
PER EACH OFG: 3 31-AUG-81

TOTAL TMU 13940.0

Combined sub-operation elements	Free.	TMU
114. MAKE UP STIFFENER TIE-BUTT ON BOTTOM SHELL WITH BOLT-ON GOOSENECK, JACK, LUGALL AT LOWER UNIT ASSEMBLY	1.00	5090.0
16, MOVE 1 TON WITH 1-TON CABLE LUGALL AT UNIT SHIPFIT {25}	1.00	6480.0
17, MOVE 25 TON ON FLAT WITH HYDRAULIC JACK AT GENERAL SHIPFIT {25}	1.00	2370.0
Total TMU		13940.0

120. COMBINED SUB-OF

INSTALL TIGHT COLLAR ON WEB FRAME AT SHELL SHOP SHIPFIT
TIME ALLOWED TO TRIM 1/4 OF THE COLLARS,
PER EACH OFG: 2 01-SEP-81

TOTAL TMU 7534 . 0

Combined sub-operation elements	FreQ,	TMU
32. INSTALL TIGHT COLLAR ON SIDE SHELL AT SHELL SHOP SHIPFIT	1.00	6942.0
53. MARK B/M WITH PENCIL AT SHELL SHOP SHIPFIT	1.00	337.0
34. IGNITE AMD EXTINGUISH TORCH FOR BURNING OR HEATING AT HYDE GENERAL SHIPFIT {25}	0.25	255.0
Total TMU		7534.0

791. COMBINED SUB-OP

INSTALL (KICKER) ATTACHMENT FOR (STIFFENER) AT FLAT (P.L.) PANEL SHOP SHIPFIT
FALCON TANKER PRESUMES
40 FT. PANEL COVERS FITTING BUT NOT DEPT. 39 FUNCTIONS.
PER EACH PANEL BLANKET OFG: 3 03-AUG-82
* MOVE KICKERS TO PANEL, SORT OUT TO
* STIFFENER LOCATIONS, GATHER TO A
* CARRIER, REMOVE FROM PANEL.

TOTAL TMU 62310.0

Combined sub-operation elements	FreQ.	TMU
785. SET-UP (TEMPORARY) ATTACHMENT FOR (STIFFENER) AT FLAT (F.L.) PANEL SHOP SHIPFIT	15.00	4050.0
786. MOVE (KICKERS) FOR (STIFFENERS) WITH HAND AT FLAT (F.L.) PANEL SHOP SHIPFIT	6.00	33480.0
784. TACK (STEEL) ON ASSEMBLY WITH SEMIAUTOMATIC AT ANY (SHOP) SHIPFIT	15.00	22080. 0
787. REMOVE (TEMPORARY) ATTACHMENT FOR (STIFFENER) AT FLAT (P.L.) PANEL SHOP SHIPFIT	15.00	2700.0
Total TMU		62310.0

792. COMBINED SUB-OP

TRANSPORT STIFFENER ON RACK WITH (MAGNET-CRANE) AT FLAT (F.L.)
PANEL SHOP SHIPFIT
FALCON TANKER METHOD ALLOWS TRANSPORT OF RACK AND
LOADING-OUT THE STIFFENERS BY MAGNET CRANE.
PER EACH PANEL BLANKET STIFFENER SET OFG: 3 03-AUG-82
* BASED ON 15 STIFFENERS AND 2 RACKS.
TOTAL TMU 36851,0

Combined sub-operation elements	FreQ,	TMU
788. TRANSPORT RACK WITH (CRANE) TO FLAT (P.L.) PANEL SHOP SHIPFIT	2.00	12266.0
789. TRANSPORT STIFFENER FOR (EANEL) UNIT WITH (MAGNET-CRANE} AT FLAT (P.L.) PANEL SHOP SHIPFIT	15.00	24585.0
Total TMU		36851,0

861. COMBINED SUB-OP

SET-UP STIFFENER ON (PANEL) UNIT WITH MAGNET (CRANE) AT FLAT
(P.L.) PANEL SHOP SHIPFIT
METHOD ALLOWS LOADING-OUT ALL STIFFENERS.
PER EACH FFG PANEL [30 FT X FULL WIDTH 3 OFG: 3 20-AUG-82
* CRANE & 2 FITTERS. 27 STIFFENERS AVE.
* 3 TACK / BAR. 81 TACKS (6011).
* COVERS 1 FITTER.

TOTAL TMU 92786.0

Combined sub-operation elements	FreQ.	TMU
783. TRANSPORT RACK WITH (CRANE) TO FLAT (P.L.) PANEL SHOP SHIPFIT	4.00	24532.0
852. TRANSPORT STIFFENER FOR (PANEL) UNIT WITH (MAGNET-CRANE} AT FLAT (P.L.) PANEL SHOP SHIPFIT	4.00	24784.0
853. POSITION STIFFENER FOR (PANEL) UNIT WITH (OEGEE-lMR) AT FLAT (P.L.) PANEL SHOP SHIPFIT	27.00	14040.0
783. TACK (STEEL) ON ASSEMBLY WITH SMAW (1/8 6011) AT ANY (SHOP) SHIPFIT	6.75	29430.0
Total TMU		92786,0

883. COMBINED SUB-OP

MAKE READY (PANEL) PLATES FOR (LAYOUT) AT ANY (P.L.) PANEL SHOP SHIPFIT
METHOD PRESUMES 2 FITTERS FOR LAYOUT, BUT ONLY 1 WITH SURVEYORS.
PER EACH PANEL OFG: 4 01-SEP-82

TOTAL TMU 109643.0

Combined sub-operation elements	FreQ.	TMU
790. MAKE READY OFERATOR (FITTER) FOR (WORK SHIFT) AT FLAT (P.L.) PANEL SHOP SHIPFIT	2.00	29018.0
650. MEASURE DECK FOR (BUTTOCK LINE) WITH (SURVEYORS) AT ANY UNIT ASSEMBLY SHOP SHIPFIT	1.00	80625.0
Total TMU		109643.0

889. COMBINED SUB-OP

MAKE READY PLATES FOR (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD ALLOWS FOR COUNTING AT SEAM-FITTING GANTRY.
PER PANEL OFG: 4 02-SEF-82
* SET 1ST PLATE, PREPARE OPERATOR,
* CHECK SQUARENESS.

TOTAL TMU 107885.0

Combined sub-operation elements		FreQ.	TMU
650.	MEASURE DECK FOR (BUTTOCK LINE) WITH (SURVEYORS) AT ANY UNIT ASSEMBLY SHOP SHIPFIT	1.00	80625.0
585.	TRANSPORT PLATE ON POSITIONER WITH MAGNET (CRANE) AT FLAT PANEL SHOP (F.L.) SHIPFIT	1.00	2291.0
617.	HOVE TOOL (LUG-ALL) WITH HAND TO FLAT PANEL SHOP (SEAM-FIT) SHIPFIT	1.00	8150.0
583.	MAKE READY (FITTER FOR SEAM MAKE-UP) AT FLAT PANEL SHOP (F.L.) SHIPFIT	I.OO	16819.0
	Total TMU		107885.0

904. COMBINED SUB-OP

MAKE READY (PANEL) PLATES FOR (STIFFENERS) AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD ALLOWS FOR COUNTING AT STIFFENER-FITTING.
PER PANEL OFG: 4 03-SEP-82
* PREPARE FITTERS, SET-UP GROUND
* AND GET CRANE.

TOTAL TMU 31344,0

Combined Sub-0Peration elements	FreQ.	TMU
790. MAKE READY OPERATOR (FITTER) FOR (WORK SHIFT) AT FLAT (P.L.) PANEL SHOP SHIPFIT	2.00	29018.0
584. SET-UP AND TEAR DOWN CLEVIS (GROUND-CLAMP) ON ASSEMBLY (PLATE) AT FLAT PANEL SHOP (P.L.) SHIPFIT	1.00	850 . 0
848. POSITION (OVERHEAD CRANE) ON UNIT WITH WINCH (FALL) AT OVERHEAD (CRANE) (P.L.) PANEL SHOP SHIPFIT	1.00	1476.0
Total TMU		31344,0

905. COMBINED SUB-OP

POSITION STIFFENERS ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT METHOD ALLOWS FOR COUNTING AT STIFFENER-FITTING. BASED ON FULL SIZED PANEL.
PER TANKER PANEL OFG: 4 03-SEP-82
* INSTALL KICKERS AND LOADOUT
* STIFFENERS.

TOTAL TMU 99161.0

Combined sub-operation elements	FreQ.	TMU
791. COMBINED SUB-OP		
INSTALL (KICKER) ATTACHMENT FOR (STIFFENER) AT FLAT (P.L.) PANEL SHOP SHIPFIT	1.00	62310.0
792. COMBINED SUB-OP		
TRANSPORT STIFFENER ON RACK WITH (MAGNET-CRANE) AT FLAT (P.L.) PANEL SHOP SHIPFIT	1.00	36851.0
TotaI TMU		99161.0

943. CONBINED SUB-OP

TRANSPORT WEB FRAME FOR (PANEL) ASSEMBLY WITH (AUXILIARY FALL) AT OVERHEAD (CRANE) (P.L.) PANEL SHOP SHIPFIT
METHOD USED TO BRING WEB FROM # 1 DOOR TO WEB FITTING AREA AND IS USER FOR HANGING LARGER WEBS.
PER WEB OFG: 3 09-SEP-82
* RIGGER HOOKS AND UNHOOKS.
* TRANSPORT BY CRANE.

TOTAL TMU 2392.0

Combined sub-operation elements	FreQ.	TMU
841. TRANSPORT OBJECT FOR ASSEMBLY WITH (AUXILIARY FALL) AT OVERHEAD (CRANE) (P.L.) PANEL SHOP SHIPFIT	1.00	1558.0
845. TRANSPORT OBJECT FOR ASSEMBLY MITH (AUXILIARY FALL) AT OVERHEAD (CRANE) (P.L.) PANEL SHOP SHIPFIT	1.50	834.0
Total TMU		2392.0

945. COMBINED SUB-OP

SET-UP WEB FRAME FOR (PANEL) ASSEMBLY WITH (AUXILIARY FALL) AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD TO LOAD OUT FULL SIZED TANKER PANEL (40' X 40'). 10 LARGE WEBS OR EQUILIVANTS. ALLOWS COUNTING AT WEB-FITTING.
PER TANKER PANEL OFG: 3 09-SEP-132
* REDO LAYOUT LINES, GET RIGGER, HOOK-UP
* TRANSPORT C. CRANE, LAND AND UNHOOK.

TOTAL TMU 76096.l 0

Combined sub-operation elements	FreQ.	TMU
941. MARK (PANEL) FOR WEB FRAME WITH STRAIGHTEDGE AT FLAT (P.L.) PANEL SHOP SHIPFIT	200.00	45600.0
848. POSITION (OVERHEAD CRANE) ON UNIT WITH WINCH (FALL) AT OVERHEAD (CRANE) (P.L.) PANEL SHOP SHIPFIT	1.00	1476.0
943. COMBINED SUB-OP TRANSPORT WEB FRAME FOR (PANEL) ASSEMBLY WITH (AUXILIARY FALL) AT OVERHEAD (CRANE) (P.L.) PAMEL SHOP SHIPFIT	10.00	23920.0
944. UNLOAD WEB FRAME FOR (PANEL) ASSEMBLY WITH HAND AT FLAT (P.L.) PANEL SHOP SHIPFIT	10.00	5100.0
Total TMU		76096.0

946. COMBINED SUB-OP

INSTALL (KICKER) ATTACHMENT FOR WEB FRAME AT FLAT (P.L.) PANEL SHOP SHIPFIT
^EY
PER TANKER PANEL OFG: 4 10-SEP-82
* OBTAIN, PLACE AT POSITION, SET-UP,
* TACK, REMOVE FROM PANEL.

TOTAL TMU 130920.0

Combined sub-operation elements	FreQ.	TMU
735. SET-UP (TEMPORARY) ATTACHMENT FOR (STIFFENER) AT FLAT (P.L.) PANEL SHOP SHIPFIT	20.00	5400.0
784. TACK (STEEL) ON ASSEMBLY WITH SEMIAUTOMATIC AT ANY (SHOP) SHIPFIT	20.00	29440.0
787. REMOVE (TEMPORARY) ATTACHMENT FOR (STIFFENER) AT FLAT (P.L.) PANEL SHOP SHIPFIT	20.00	3600.0
786. MOVE (KICKERS) FOR (STIFFENERS) WITH HAND AT FLAT (P.L.) PANEL SHOP SHIPFIT	16.00	89280.0
704. MOUE (OPERATOR) ON ASSEMBLY WITH (KNEEL) AT ANY (WORK AREA) SHIPFIT	20.00	3200.0
Total TMU		130920.0

947. COMBINED SUB-OP

ALIGN WEB FRAME ON (PANEL) ASSEMBLY WITH JACK AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD ALLOWS ALIGNMENT OF WEB TO PROPER POSITION VS. STIFFENER CUTOUT S. DOES NOT COVER PLUMBING.
PER TANKER WEB [ANY HEIGHT @ 20FT.] OFG: 3 10-SEP-82
* TACK 1 KICKER TO PANEL AND 1 TO WEB.
* PLACE JACK AND MOVE PANEL TO POSITION.
* BASED ON 5 WEB ALIGNMENT.

TOTAL TMU 7434. a

Combined sub-operation elements	FreQ.	TMU
803. MOVE TOOL TO FLAT (P.L.) PANEL SHOP SHIPFIT	0.20	1580.8
17. MOVE 25 TON ON FLAT WITH HYDRAULIC JACK AT GENERAL SHIPFIT {25}	1.00	2370.0
784. TACK (STEEL) ON ASSEHBLY WITH SEMIAUTOMATIC AT ANY (SHOP) SHIPFIT	0.50	736.0
787. REMOVE (TEMPORARY) ATTACHMENT FOR (STIFFENER) AT FLAT (P.L.) PANEL SHOP SHIPFIT	0.20	36.0
704. MOVE (OPERATOR) ON ASSEMBLY WITH (KNEEL) AT ANY (WORK AREA) SHIPFIT	1.00	160.0
614. MOVE (OPERATOR) ON ASSEMBLY AT ANY LAYOUT AREA SHIPFIT	40.00	320.0
786. MOVE (KICKERS) FOR (STIFFENERS) WITH HAND AT FLAT (P.L.) PANEL SHOP SHIPFIT	0.40	2232.0
Total TMU		7434.8

953. COMBINED SUB-OP

MAKE UP WEB FRAME (FLATS) ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD FOR MAKING UP FLAT BETWEEN LONGITUDINALS. PRESUMES TANKERS, BU T CAN BE USED FOR FFG WITH ALLOWANCES FOR LESS WELD. 30 INCH FRAME SF ACING.
PER WEB CUTOUT OFG: 2 15-SEP-82
* CHECK POSITION VS. LAYOUT LINES,
* PULL TO POSITION, TACK, CHANGE
* LUG-ALL POSITION, PULL, CHECK AND
* ALIGN MIDDLE BY HAMMER, TACK.
* FREQ. FOR SOME DOG&WEDGE PLUS
* BOLT&CLIP.

TOTAL TMU 15872.5

Combined sub-operation elements	FreQ.	TMU
704. MOVE (OPERATOR) ON ASSEMBLY WITH (KNEEL) AT ANY (WORK AREA) SHIPFIT	4.00	640.0
16. MOVE 1 TON WITH l-TON CABLE LUGALL AT UNIT SHIPFIT {25}	2.00	12960.0
15. MOVE 5 TON IN DOWNHAND POSITION WITH DOG AND WEDGE AT GENERAL SHIPFIT {25}	0.12	198.8
14. MOVE 2 TON WITH BOLT & CLIP AT GENERAL SHIPFIT {25}	0.25	522.5
784. TACK (STEEL) ON ASSEMBLY WITH SEMIAUTOMATIC AT ANY (SHOP) SHIPFIT	0.50	736.0
950. MAKE UP WEB FRAME ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT	1.00	420.0
803. MOVE TOOL TO FLAT (P.L.) PANEL SHOP SHIPFIT	0.05	395.2
Total TMU		15872.5

934. COMBINED SUB-OP

MOVE ASSEMBLY WITH JACK AT ANY (WORK AREA) SHIPFIT
METHOD ALLOWS JACK USE AND INSTALLATION OF KICKER. NO ALLOWANCE FOR
G RINDING KICKER SCARS OR 'UNWELDING.'
PER EACH USE OFG: 3 15-SEP-82
* GET KICKER, TACK IT, USE JACK,
* REPLACE KICKER TO STGE.

TOTAL TMU 4288.8

Combined sub-operation elements	FreQ.	TMU
785. SET-UP (TEMPORARY) ATTACHMENT FOR (STIFFENER) AT FLAT (P.L.) PANEL SHOP SHIPFIT	0.50	135.0
786. MOVE (KICKERS) FOR (STIFFENERS) WITH HAND AT FLAT (P.L.) PANEL SHOP SHIPFIT	0.20	1116.0
787. REMOVE (TEMPORARY) ATTACHMENT FOR (STIFFENER) AT FLAT (P.L.) PANEL SHOP SHIPFIT	0.10	18.0
782. TACK (STEEL) ON ASSEMBLY WITH SMAM (1/8 7018) AT ANY (SHOP) SHIPFIT	0.25	649.8
17. MOVE 25 TON ON FLAT WITH HYDRAULIC JACK AT GENERAL SHIPFIT {25}	1.00	2370.0
Total TMU		4288,8

COMBINED SUB-OP

INSTALL COLLAR ON WEB FRAME AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD MAKES USE OF EARLIER FILED DATA WITH PROPER FREQ. FOR TANKERS.
PER EACH CUTOUT OFG: 2 15-SEP-82
* GET COLLAR, PLACE TO WEB, TACK.

TOTAL TMU 1570.8

	Combined sub-operation elements	FreQ.	TMU
557.	MOVE (SMALL PARTS) FOR ASSEMBLY WITH HAND AT (INVERTED ALUMINUM) UNIT ASSEMBLY SHOP SHIPFIT	0.25	395.0
559.	INSTALL COLLAR ON BULKHEAD AT ANY (WORK AREA) SHIPFIT	1.00	310.0
784.	TACK (STEEL) ON ASSEMBLY WITH SEMIAUTOMATIC AT ANY (SHOP) SHIPFIT	0.33	485.8
704.	MOVE (OPERATOR) ON ASSEMBLY WITH (KNEEL) AT ANY (WORK AREA) SHIPFIT	1.00	160.0
614.	MOVE (OPERATOR) ON ASSEMBLY AT ANY LAYOUT AREA SHIPFIT	2.50	20.0
	Total TMU		1570.8

957. COMBINED SUB-OP

ALIGN (BY PLUMIBING) WEB FRAME ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD FOR PLUMBING WEB AND SQUARING STIFFENER. FREQ. FOR 1 OUT OF 4.
PER WEB CUTOUT OFG: 2 16-SEP-82
* CHECK FOR SQUARE, FULL WITH LUG-ALL,
* PUSH STIFFENER AND TACK IT TO WEB.

TOTAL TMU 8935.4

Combined sub-operation elements	FreQ.	TMU
803. MOVE TOOL TO FLAT (P.L.) PANEL SHOP SHIPFIT	0.05	395.2
703. MOVE (OPERATOR) ON ASSEMBLY WITH (BEND) AT ANY (WORK AREA) SHIPFIT	2.00	120.0
704. MOVE (OPERATOR) ON ASSEMBLY WITH (KNEEL) AT ANY (WORK AREA) SHIPFIT	1.00	160.0
16. MOVE 1 TON WITH 1-TON CABLE LUGALL AT UNIT SHIPFIT {25}	1.00	6480.0
954. COMBINED SUB-OP		
MOVE ASSEMBLY WITH JACK AT ANY (WORK AREA) SHIPFIT	0.25	1072.2
949. ALIGN (BY PLUMBING) WEB FRAME ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT	1.00	340.0
784. TACK (STEEL) ON ASSEMBLY WITH SEMIAUTOMATIC AT ANY (SHOP) SHIPFIT	0.25	368.0
Total TMU		8935.4

960. COMBINED SUB-OP

INSTALL (KICKER) ON ASSEMBLY AT ANY (WORK AREA) SHIPFIT
METHOD FOR KICKERS, E.G., ASS-HOLES, ETC., THAT ARE USED INDEPENDENTLY
PER EACH OFG: 3 16-SEP-82
* GET & SET-UP KICKER, TACK, RETURN IT
* STGE. REMOVAL DONE SEPARATELY.

TOTAL TMU 3403.5

Combined sub-operation elements	FreQ.	TMU
786. MOVE (KICKERS) FOR (STIFFENERS) WITH HAND AT FLAT (P.L.) PANEL SHOP SHIPFIT	0.30	1674.0
785. SET-UP (TEMPORARY) ATTACHMENT FOR (STIFFENER) AT FLAT (P.L.) PANEL SHOP SHIPFIT	1.00	270.0
704. HOVE (OPERATOR) ON ASSEMBLY WITH (KNEEL) AT ANY (WORK AREA) SHIPFIT	1.00	160.0
782. TACK (STEEL) ON ASSEMBLY WITH SMAW (1/8 7018) AT ANY (SHOP) SHIPFIT	0.50	1299.5
Total TMU		3403.5

958. COMBINED SUB-OP

ALIGN BRACKET FOR WEB FRAME AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD COVERS MAKING UP BRACKETS FOR TANKER WEBS < 6 FT. HIGH @ 20 FT. LONG. BKTS. MADE UP TO STIFFENERS.
PER WEB CUTOUT OFG: 2 16-SEP-82
* TIGHTEN BACKUP STRUCTURE WITH LUG-ALL
* OR JACK AND TACK.

TOTAL TMU 5776.3

Combined sub-operation elements	FreQ.	TMU
954. COMBINED SUB-OP		
MOVE ASSEMBLY WITH JACK AT ANY (MORK AREA) SHIPFIT	0.62	2680.5
948. ALIGN BRACKET FOR WEB FRAME AT FLAT (P.L.) PANEL SHOP SHIPFIT	1.00	180.0
16. MOVE 1 TON WITH 1-TON CABLE LUGALL AT UNIT SHIPFIT {25}	0.37	2430.0
784. TACK (STEEL) ON ASSEMBLY WITH SEMIAUTOMATIC AT ANY (SHOP) SHIPFIT	0.33	485.8
Total TMU		5776.3

	6,50	9568.0
Total TMU		86636.0

965. COMBINED SUB-OP

MAKE UP (TRANSVERSE) WEB FRAME ON (LONGITUDINAL) WEB FRAME AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD BASED ON 6 FT, HIGH TRANSVERSE WEB THAT IS MADE UP WITH A LUG-A LL .
PER TRANSVERSE WEB FRAME OFG: 4 17-SEP-82
* USE LARGE SQUARE TO CHECK PLUHB,
* PULL WITH LUG-ALL, TACK, FREQ, FOR
* JACK USE AT DIFFICULT POINTS,

TOTAL TMU 14770.9

Combined sub-operation elements	Freq,	TMU

957, COMBINED SUB-OP

ALIGN (BY PLUMBING) WEB FRAME ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT

	1.00	8935.4

784, TACK (STEEL) ON ASSEMBLY WITH SEMIAUTOMATIC AT ANY (SHOP) SHIPFIT

	1.00	1472.0

705, HOVE (OPERATOR) ON ASSEMBLY WITH (CLIMB-OBJECT) AT ANY (WORK AREA) SHIPFIT

	2.00	640.0

960, COMBINED SUB-OP

INSTALL (KICKER) ON ASSEMBLY AT ANY (WORK AREA) SHIPFIT

	1.00	3403.5

614, HOVE (OPERATOR) ON ASSEMBLY AT ANY LAYOUT AREA SHIPFIT

	40.00	320.0
Total TMU		14770.9

964. COMBINED SUB-OP

MAKE UP (LONGITUDINAL) WEB FRAME ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD FOR MAKING UP LONGITUDINALLY RUNNING WEBS THAT HAVE TRANSVERSE WEBS INTERSECTING EVERY 8 FT. FITTER WORK ONE SIDE ONLY.
DOUBLE FOR TWO OPERATORS.
PER WEB > 6 FT. HIGH AND @ 40 FT. LONG. OFG: 4 17-SEP-82
* FITTER STARTS AT ONE AND WORKS TO THE
* OTHER 'JACKIN & TACKIN'. USES
* BOLT & CLIPS TO PULL WEB TO PANEL
* JACKS USED WITH BLOCKING FOR ALIGNING
* TIME ALLOWED FOR PREP AND MOVING
* AROUND THE SMALL WEBS ON UNIT.

TOTAL TMU 86636.0

Combined sub-operational elements	FreQ.	TMU
614. MOVE (OPERATOR) ON ASSEMBLY AT ANY LAYOUT AREA SHIPFIT	500.00	4000,0
14. MOVE 2 TON WITH BOLT & CLIP AT GENERAL SHIPFIT {25}	10.00	20900.0
673. ADJUST (BUDDA JACK) ON DECK WITH HAND AT ANY (WORK AREA) SHIPFIT	10.00	3100.0
17. MOVE 25 TON ON FLAT WITH HYDRAULIC JACK AT GENERAL SHIPFIT {25}	10.00	23700.0
704. MOVE (OPERATOR) ON ASSEMBLY WITH (KNEEL) AT ANY (WORK AREA) SHIPFIT	20.00	3200,0
705. MOVE (OPERATOR) ON ASSEMBLY WITH (CLIMB-OBJECT) AT ANY (WORK AREA) SHIPFIT	10.00	3200.0
803. MOVE TOOL TO FLAT (P.L.) PANEL SHOP SHIPFIT	2.00	1580800
557. MOVE (SMALL PARTS) FOR ASSEMBLY WITH HAND AT (INVERTED ALUMINUM) UNIT ASSEMBLY SHOP SHIPFIT	2.00	3160.0
784. TACK (STEEL) ON ASSEMBLY WITH SEMIAUTOMATIC AT ANY (SHOP) SHIPFIT		

967.l COMBINED SUB-OP

INSTALL (DOCKING) BRACKET ON WEB FRAME AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD FOR INSTALLING DOCKING BRACKETS THAT ARE SHIPPED LOOSE TO JOB. THESE BRACKETS FOUND ON LONGITUDINAL WEBS AND MAKE UP TO LONGITUDINAL STIFFENERS.
PER TANKER BRACKET OFG: 4 20-SEP-82
* LAYOUT, SET KICKERS, TRANSPORT WITH
* CRANE, LAND, SCRIBE, PULL TIGHT.
* PUSH TO LOCATION, TACK.

TOTAL TMU 54074.6

Combined sub-operation elements	FreQ.	TMU
206. MEASURE AND MARK ASSEMBLY FOR LOCATION OF FOUNDATION OR SMALL TANK LOWER UNIT ASSEMBLY SHOP SHIPFIT	1.00	11040.0
960. COMBINED SUB-OP INSTALL (KICKER) ON ASSEMBLY AT ANY (WORK AREA) SHIPFIT	2.00	6807.0
943. COMBINED SUB-OP TRANSPORT WEB FRAME FOR (PANEL) ASSEMBLY WITH (AUXILIARY FALL) AT OUERHEAD (CRANE) (P.L.) PANEL SHOP SHIPFIT	1.00	2392.0
945. COMBINED SUB-OP SET-UP WEB FRAME FOR (PANEL) ASSEMBLY WITH (AUXILIARY FALL) AT FLAT (P.L.) PANEL SHOP SHIPFIT	0.10	7609.6
690. MEASURE (AND MARK) BRACKET FOR (TRIMMING) WITH STEEL TAPE AT (INUERTED ALUMINUM) UNIT ASSEMBLY SHOP SHIPFIT	1.00	1410.0
952. FLAME CUT (STEEL) FOR (BURNING PROCESS) WITH TORCH AT ANY (WORK AREA) SHIPFIT	3.00	15012.0
14. MOVE 2 TON WITH BOLT & CLIP AT GENERAL SHIPFIT {25}		

966. COMBINED SUB-OP

ALIGN (DOCKING) BRACKET ON WEB FRAME AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD FOR ALIGNING AND TACKING FIRE-INSTALLED BRACKETS. THESE BRACKET S ARE FOUND ON LONGITUDINAL WEBS AND MAKE UP TO LONGITUDINAL STIFFENER S.
PER BRACKET (TANKER) OFG: 4 17-SEP-82
* PULL TIGHT WITH BOLT&CLIP, PUSH TO
* LOCATION WITH JACK, TACK.

TOTAL TMU 12278,8

Combined sub-operational elements	FreQ.	TMU
14. MOVE 2 TON WITH BOLT & CLIP AT GENERAL SHIPFIT {25}	1.00	2090.0
954. COMBINED SUB-OP MOVE ASSEMBLY WITH JACK AT ANY (WORK AREA) SHIPFIT	1.00	4288,8
704. MOVE (OPERATOR) ON ASSEMBLY WITH (KNEEL) AT ANY (WORK AREA) SHIPFIT	1.00	160.0
952. FLAME CUT (STEEL) FOR (BURNING PROCESS) WITH TORCH AT ANY (WORK AREA) SHIPFIT	1.00	5004.0
784. TACK (STEEL) ON ASSEMBLY WITH SEMIAUTOMATIC AT ANY (SHOP) SHIPFIT	0.50	736.0
Total TMU		12278.8

1020. INSPECT CUTOUT ON WEB FRAME WITH SQUARE AT FLAT (P.L.) PANEL SHOP SHIPFIT

27.00 12933.0

952. FLAME CUT (STEEL) FOR (BURNING PROCESS) WITH TORCH AT ANY (WORK AREA) SHIPFIT

4.50 22518.0

853. POSITION STIFFENER FOR (PANEL) UNIT WITH (OEGEE-BAR) AT FLAT (P.L.) PANEL SHOP SHIPFIT

4.00 2080.0

703. MOVE (OPERATOR) ON ASSEMBLY WITH (BEND) AT ANY (WORK AREA) SHIPFIT

6.00 360 .0

793. ALIGN STIFFENER ON (PANEL) UNIT WITH (SLEDGE) HAMMER AT FLAT (P.L.) PANEL SHOP SHIPFIT

2.OO 1660.0

614. MOVE (OPERATOR) ON ASSEMBLY AT ANY LAYOUT AREA SHIPFIT

160.00 1280.0

784. TACK (STEEL) ON ASSEMBLY WITH SEMIAUTOMATIC AT ANY (SHOP) SHIPFIT

1.00 1472.0

Total TMU 58703,0

		1.00	2090.0
15.	MOVE 5 TON IN DOWNHAND POSITION WITH DOG AND WEDGE AT GENERAL SHIPFIT {25}		
		3.00	4770.0
784.	TACK (STEEL) ON ASSEMBLY WITH SEMIAUTOMATIC AT ANY (SHOP) SHIPFIT		
		2.00	2944.0
	Total TMU		54074.6

1029. COMBINED SUB-OP

POSITION WEB FRAME ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD TO POSITION 12 IN. HIGH FFG WEB @ 40 FT. LENGTH. PRESUMES 27 S TIFFENER CUTOUTS AND TWO WEB SECTIONS.
PER TRANSVERSE WEB OFG: 4 23-SEP-82
* REDO LAYOUT; TRANSPORT BY CRANE;
* LAND WEBS ON FACEPLATES; CHECK C/O'S
* DEPTH VS. STIFFENER HEIGTH; STAND WEBS;
* ALIGN AND TACK.

TOTAL TMU 58703.0

	Combined sub-operation elements	Freq.	TMU
941.	MARK (PANEL) FOR WEB FRAME WITH STRAIGHTEDGE AT FLAT (P.L.) PANEL SHOP SHIPFIT		
		40.00	9120.0
943.	COMBINED SUB-OP		
	TRANSPORT WEB FRAME FOR (PANEL) ASSEMBLY WITH (AUXILIARY FALL) AT OVERHEAD (CRANE) (P.L.) PANEL SHOP SHIPFIT		
		2.00	4784.0
944.	UNLOAD WEB FRAME FOR (PANEL) ASSEMBLY WITH HAND AT FLAT (P.L.) PANEL SHOP SHIPFIT		
		2.00	1020.0
848.	POSITION (OVERHEAD CRANE) ON UNIT WITH WINCH (FALL) AT OVERHEAD (CRANE) (P.L.) PANEL SHOP SHIPFIT		
		1.00	1476.0

1U31. COMBINED SUB-OP

INSTALL (TOE) BRACKET WITH (JIG) AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD FOR OBTAINING, INSTALLING, AND TACKING.
PER EACH OFG: 2 23-SEP-82
* COVERS ALL SHALL BKTS. INSTALLED ON
* WEB AT PANEL LINE.

TOTAL TMU 1798.0

Combined sub-operation elements	Freq.	TMU
557. HOVE (SMALL PARTS) FOR ASSEMBLY WITH HAND AT (INVERTED ALUMINUM) UNIT ASSEMBLY SHOP SHIPFIT	0.10	158.0
709. INSTALL (TOE) BRACKET WITH JIG AT ANY (WORK AREA) SHIPFIT	1.00	390.0
704. HOVE (OPERATOR) ON ASSEMBLY WITH (KNEEL) AT ANY (WORK AREA) SHIPFIT	1.00	160.0
783. TACK (STEEL) ON ASSEMBLY WITH SMAW (1/8 6011) AT ANY (SHOP) SHIPFIT	0.25	1090.0
Total TMU		1798.0

1030. COMBINED SUB-OP

MAKE UP WEB FRAME ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD TO MAKE UP 12 IN HIGH FFG WEB @ 40 FT. FRESUMES 27 STIFFENERS AND TWO WEB SECTIONS.
PER TRANSVERSE WEB FFG OFG: 2 23-SEP-82
* MAKE UP-FLAT USING KING CLAMP; FREQ.
* FOR BOLT&CLIF AND DOG2&WEDGE USE.

TOTAL TMU 111134.0

Combined sub-operation elements	FreQ.	TMU
1021. MAKE UP WEB FRAME (FLAT) ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT	27.00	7560.0
1019. MOVE WEB FRAME ON (PANEL) UNIT WITH (KING WEB) CLAMP AT FLAT (P.L.) PANEL SHOP SHIPFIT	27.00	48330.0
14. MOVE '2 TON WITH BOLT & CLIP AT GENERAL SHIPFIT {25}	6.00	12540.0
15. MOVE 5 TON IN DOWNHAND POSITION WITH DOG AND WEDGE AT GENERAL SHIPFIT {25}	8.00	12720.0
704. MOVE (OPERATOR) ON ASSEMBLY WITH (KNEEL) AT ANY (WORK AREA) SHIPFIT	54.00	8640.0
784. TACK (STEEL) ON ASSEMBLY WITH SEMIAUTOHATIC AT ANY (SHOP) SHIPFIT	14.50	21344.0
Total TMU		111134.0

1041. COMBINED SUB-OP

MAKE READY (FFG PANEL) FOR ASSEMBLY AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD ALLOWS PANEL PREP. PER SHIFT.
PER EACH FFG PANEL OFG: 4 23-SEP-82

TOTAL TMU 111616.0

Combined sub-operation elements		Freq.	TMU
790.	MAKE READY OPERATOR (FITTER) FOR (WORK SHIFT) AT FLAT (P.L.) PANEL SHOP SHIPFIT	6.00	87054.0
584.	SET-UP AND TEAR DOWN CLEVIS (GROUND-CLAMP) ON ASSEMBLY (PLATE) AT FLAT PANEL SHOP (P.L.) SHIPFIT	1.00	850.0
803.	MOVE TOOL TO FLAT (P.L.) PANEL SHOP SHIPFIT	3.00	23712.0
	Total TMU		111616.0

SHIPFITTING

1040. COMBINED SUB-OP

MAKE READY (TANKER PANEL) FOR ASSEMBLY AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD ALLOWS PANEL PREP. PER SHIFT.
PER EACH PANEL OFG: 4 23-SEP-82

TOTAL TMU 400380.0

Combined sub-operation elements	Freq.	TMU
790. MAKE READY OPERATOR (FITTER) FOR (WORK SHIFT) AT FLAT (P.L.) PANEL SHOP SHIPFIT	10.00	145090.0
584. SET-UP AND TEAR DOWN CLEVIS (GROUND-CLANP) ON ASSEMBLY (PLATE) AT FLAT PANEL SHOP (P.L.) SHIPFIT	1.00	850.0
945. COMBINED SUB-OP		
SET-UP WEB FRAME FOR (PANEL) ASSEMBLY WITH (AUXILIARY FALL) AT FLAT (P.L.) PANEL SHOP SHIPFIT	1.00	76096.0
946. COMBINED SUB-OP		
INSTALL (KICKER) ATTACHMENT FOR WEB FRAME AT FLAT (P.L.) PANEL SHOP SHIPFIT	1.00	130920.0
803. MOVE TOOL TO FLAT (P.L.) PANEL SHOP SHIPFIT	6.00	47424,0
Total TMU		400380.,0

888. COMBINED SUB-OP

POSITION PLATES FOR (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD ALLOWS FOR COUNTING AT SEAM-FITTING GANTRY.
PER NUMBER OF SEAMS OFG: 3 02-SEP-82
* SET PLATES, ATTACH GROUND, MAKE 1ST.
* TACK. ALLOWS USING LUG-ALL.

TOTAL TMU 10471.0

Combined sub-operation elements	Freq.	TMU
586. ALIGN PLATE ON POSITIONER WITH MAGNET AT FLAT PANEL SHOP (P.L.) SHIPFIT	1.00	5671 .0
587. TACK PLATE ON POSITIONER WITH SEMIAUTOMATIC AT FLAT PANEL SHOP (P.L.) SHIPFIT	1.00	720.0
552. MOVE (1 TON) IN (ANY POSITION) WITH HOIST (CABLE LUGALL) AT ANY (WORK AREA) SHIPFIT	0.50	3230.0
584. SET-UP AND TEAR DOWN CLEVIS (GROUND-CLAMP) ON ASSEMBLY (PLATE) AT FLAT PANEL SHOP (P.L.) SHIPFIT	1.00	830.0
Total TMU		10471.0

880. COMBINED SUB-OP

MARK (PANEL) PLATE FOR (LAYOUT) AT ANY (P.L.) PANEL SHOP SHIPFIT
METHOD USED FOR PANEL LAYOUT ON PANEL LINE.
PER FOOT OF STIFFENERS 2 WEBS OFG: 2 01-SEP-82

TOTAL TMU 239.0

Combined sub-operation elements	FreQ.	TMU
610. MARK PLATE WITH CHALKLINE AT ANY PANEL SHOP SHIPFIT	1.00	51.0
609. MARK (LAYOUT LINE) ON DECK (PLATE) WITH (HAMMER AND) PUNCH AT ANY (WORK AREA) SHIPFIT	1.00	188.0
Total TMU		239.0

1043. COMBINED SUB-OP

MAKE READY OPERATOR FOR (PANEL) ASSEMBLY AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD FOR TOTAL PREP TIME FOR FFG PANEL.
PER EACH PANEL OFG: 4 24-SEP-82

TOTAL TMU 453274.0

Combined sub-operation elements	FreQ.	TMU
889. COMBINED SUB-OP MAKE READY PLATES FOR (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT	1.00	107885.0
883. COMBINED SUB-OP MAKE READY (PANEL) PLATES FOR (LAYOUT) AT ANY (P.L.) PANEL SHOP SHIPFIT	1.00	109643.0
904. COMBINED SUB-OP		

MAKE READY (PANEL) PLATES FOR (STIFFENERS) AT FLAT (P.L.) PANEL SHOP SHIPFIT

1.00 31344.0

861. COMBINED SUB-OP

SET-UP STIFFENER ON (PANEL) UNIT WITH MAGNET (CRANE) AT FLAT (P.L.) PANEL SHOP SHIPFIT

1.00 92786.0

1041. COMBINED SUB-OP

MAKE" READY (FFG PANEL) FOR ASSEMBLY AT FLAT (P.L.) PANEL SHOP SHIPFIT

1.00 111616.0

Total TMU 453274.0

891. COMBINED SUB-OP

MAKE UP (THIN) PLATES FOR (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD ALLOWS FOR COUNTING AT SEAM-FITTING GANTRY.
PER FOOT (TOTAL SEAM FOOTAGE) OFG: 2 02-SEP-82
* MAKE UP FOR PLATES LESS THAN OR EQUAL
* TO .375 IN. OR 15.3 LBS.

TOTAL TMU 404.0

Combined sub-operation elements	FreQ.	TMU
613. HAKE-UP SEAM ON POSITIONER WITH SHIM (PLATE) AT FLAT PANEL SHOP (P.L.) SHIPFIT	1.00	371.0
618, TRANSPORT OPERATOR ON POSITIONER AT FLAT PANEL SHOP SHIPFIT	1.00	33.0
Total TMU		404.0

882. COMBINED SUB-OP

MEASURE (PANEL) PLATE FOR (LAYOUT) AT ANY (P.L.) PANEL SHOP SHIPFIT
METHOD USED FOR 18 INCH FRAME SPACING AND 8 FOOT WEB SPACING.
PER EACH FOOT OF PANEL PERIMETER OFG: 2 01-SEP-82
* 1 MARK / 2.4 FEET.

TOTAL TMU 223.2

Combined sub-operation elements	FreQ.	TMU
614. MOVE (OPERATOR) ON ASSEMBLY AT ANY LAYOUT AREA SHIPFIT	1.00	8.0
612. ARRANGE TAPE ON ASSEMBLY AT ANY LAYOUT AREA SHIPFIT	1.00	43.0
611. MARK ASSEMBLY WITH MARKER AT ANY LAYOUT AREA SHIPFIT	0.42	37.8
879. HARK PLATE WITH MARKER AT ANY LAYOUT AREA SHIPFIT	0.42	134.4
Total TMU		223.2

1034. COMBINED SUB-OP

MAKE UP (TRANSVERSE) WEB FRAME ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD FOR COMPLETE MANUAL MAKE UP OF 12 IN. WEB @ 40 FT. LENGTH. 27 STIFFENER C/O'S AND 18 IN. FRAME SPACING. WELD FOOTAGE: FLAT - 65; T IE-3UTT - 3.5; STIF+ FACEPLATES - 18; COLLARS - 90; SHALL BK
PER TRANSVERSE WEB OFG: 4 23-SEP-82
* SMALL BKTS. 8 FT. OF WELD.
* REDO LAYOUT; LAND WEBS; CHECK C/O'S;
* SET-UP WEBS; ALIGN AND TACK; MAKE UP;
* PLUMB AND SET STIFF.; TACK TIE-BUTTS;
* INSTALL COLLARS AND BKTS.

TOTAL TMU 571787.6

Combined sub-operation elements	FreQ.	TMU

1029. COMBINED SUB-OP

POSITION WEB FRAME ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT

1.00 58703.0

957. COMBINED SUB-OF

ALIGN (BY PLUMBING) WEB FRAME ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT

9.00 80418.6

115. COMBINED SUB-OF

MAKE UP STIFFENER TIE-BUTT WITH BOLT-ON GOOSENECK & JACK AT LOWER UNIT ASSEMBLY SHOP SHIPFIT

1.00 13940.0

76. INSTALL NON-TIGHT COLLAR ON BOTTOM SHELL AT LOWER UNIT ASSEMBLY SHOP SHIPFIT

27.00 79002.0

120. COMBINED SUB-OP

INSTALL TIGHT COLLAR ON WEB FRAME AT SHELL SHOP SHIPFIT

27.00 203418.0

1031. COMBINED SUB-OP

INSTALL (TOE) BRACKET WITH (JIG) AT FLAT (P.L.) PANEL SHOP SHIPFIT

14.00 25172.0

1030. COMBINED SUB-OP

MAKE UP WEB FRAME ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT

1.00 111134.0

Total TMU 571787.6

1033. COMBINED SUB-OP

INSTALL (KNEE) BRACKET ON WEB FRAME AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD DESCRIBES PLACING AND TACKING BRACKET ON ONE LEG ONLY. CAN BE HANDLED MANUALLY. 3 FT. OF WELD.
PER FFG TYPE BRACKET OFG: 4 23-SEP-82
* SET ON WEB, CHECK, TACK,

TOTAL TMU 11187.0

Combined sub-operation elements	FreQ.	TMU
557. MOVE (SHALL PARTS) FOR ASSEMBLY WITH HAND AT (INVERTED ALUMINUM) UNIT ASSEMBLY SHOP SHIPFIT	1.00	1580.0
692. INSTALL BRACKET ON (HOUSE SIDE) AT (INVERTED ALUMINUM) UNIT ASSEMBLY SHOP SHIPFIT	1.00	460.0
704. MOVE (OPERATOR) ON ASSEMBLY WITH (KNEEL) AT ANY (WORK AREA) SHIPFIT	1.00	160.0
960. COMBINED SUB-OP		
INSTALL (KICKER) ON ASSEMBLY AT ANY (WORK AREA) SHIPFIT	2.00	6807.0
783. TACK (STEEL) ON ASSEMBLY WITH SMAW (1/8 6011) AT ANY (SHOP) SHIPFIT	0.50	2180.0

Total TMU 11187.0

956, COMBINED SUB-OP

INSTALL HEADER ON (PANEL) AT FLAT (P.L.) FANEL SHOP SHIPFIT
HEADER SHALL AND LIGHT ENOUGH TO BE EASILY HANDLED MANUALLY.
PER HEADER OFG: 3 15-SEP-82
* FITTER LOCATES HEADER POSITION; SETS
* JIG; TRANSFERS LINES TO HEADER; HAS
* HEADER TRIMMED; THEN ALIGNS AND TACKS
* HEADER.

TOTAL TMU 18852. 0

Combined sub-operation elements	Freq.	TMU
557. MOVE (SMALL PARTS) FOR ASSEMBLY WITH HAND AT (INVERTED ALUMINUM) UNIT ASSEMBLY SHOP SHIPFIT	1.00	1580.0
721. MARK ASSEMBLY FOR FOUNDATION (LOCATION) AT ANY. (WORK AREA) SHIPFIT	1.OO	6120.0
739. MEASURE HEADER ON UNIT WITH (ADJUSTABLE) JIG AT (INVERTED ALUMINUM) UNIT ASSEMBLY SHOP SHIPFIT	1.00	2370,0
740. ALIGN HEADER ON ASSEMBLY AT (INVERTED ALUMINUM) UNIT ASSEMBLY SHOP SHIPFIT	1.OO	1120.0
783. TACK (STEEL) ON ASSEMBLY WITH SMAM (1/8 6011) AT ANY (SHOP) SHIPFIT	1.OO	4360.0
952. FLAME CUT (STEEL) FOR (BURNING PROCESS) WITH TORCH AT ANY (WORK AREA) SHIPFIT	0.50	2502.O
614. HOVE (OPERATOR) ON ASSEMBLY AT ANY LAYOUT AREA SHIPFIT	100.OO	800.0
Total TMU		18852.0

1044. COMBINED SUB-OF

MAKE READY OFERATOR FOR (PANEL) ASSEMBLY AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD FOR TOTAL PREP TIME FOR TANKER PANEL.
PER EACH TANKER PANEL OFG: 4 24-SEP-82

TOTAL TMU 748413.0

Combined sub-operation elements	Freq.	TMU
889. COMBINED SUB-OP MAKE READY PLATES FOR (PANEL) AT FLAT (P.L,) PANEL SHOP SHIPFIT	1.00	107885.0
883. COMBINED SUB-OP MAKE READY (PANEL) FLATES FOR (LAYOUT) AT ANY (P.L.) PANEL SHOP SHIPFIT	1.OO	109643.0
904. COMBINED SUB-OP MAKE READY (PANEL) PLATES FOR (STIFFENERS) AT FLAT (P.L.) PANEL SHOP SHIPFIT	1.00	31344.O
905. COMBINED SUB-OF POSITION STIFFENERS ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT	1.OO	99161.0
1040. COMBINED SUB-OP MAKE READY (TANKER PANEL) FOR ASSEMBLY AT FLAT (P.L.) PANEL SHOP SHIPFIT	1.OO	400380.0
Total TMU		748413.0

1053. COMBINED SUB-OF

HAKE UP PLATES FOR (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD ALLOWS FOR COUNTING AT SEAM-FITTING GANTRY.
PER FOOT (TOTAL SEAM FOOTAGE) OFG: 2 02-SEP-82
* MAKE UP FOR PLATES GREATER THAN
* .375 IN. OR 15.3 LBS.

TOTAL TMU 593.0

Combined sub-operation elements	Freq.	TMU
588. MAKE UP SEAM ON POSITIONER WITH JACK AND MAGNETS AT FLAT PANEL SHOP (P.L.) SHIPFIT	1.00	560.0
618. TRANSPORT OPERATOR ON POSITIONER AT FLAT PANEL SHOP SHIPFIT	1.00	33.0
Total TMU		593.0

881. COMBINED SUB-OP

MEASURE (PANEL) PLATE FOR (LAYOUT) AT ANY (P.L.) PANEL SHOP SHIPFIT
METHOD USED FOR 30 INCH FRAME SPACING AND 8 FOOT WEB SPACING.
PER FOOT OF PERIMETER OFG: 2 01-SEP-82
* 1 MARK / 4 FEET.

TOTAL TMU 153.5

Combined sub-operation elements	Freq.	TMU
614. MOUE (OPERATOR) ON ASSEMBLY AT ANY LAYOUT AREA SHIPFIT	1.00	8.0
612. ARRANGE TAPE ON ASSEMBLY AT ANY LAYOUT AREA SHIPFIT	1.00	43.0
611. MARK ASSEMBLY WITH MARKER AT ANY LAYOUT AREA SHIPFIT	0.25	22.5
879. MARK PLATE WITH MARKER AT ANY LAYOUT AREA SHIPFIT	0.25	80.0
Total TMU		153.5

798. COMBINED SUB-OP

MAKE UP STIFFENER ON (PANEL) UNIT WITH (GANTRY) AT FLAT (P.L.)
PANEL SHOP SHIPFIT
METHOD DESCRIBES OPERATION OF ONE MECHANIC, MUST BE DOUBLED TO COVER BOTH OPERATORS.
PER EACH STIFFENER UP TO 20 FT. IN LENGTH OFG: 3 06-AUG-82
* POSITION GANTRY, MAKE UP STIFFENER.
* TACKING BY SEMIAUTOMATIC.

TOTAL TMU 13040.0

Combined sub-operation elements	Freq.	TMU
797, POSITION (GANTRY) ON (PANEL) UNIT AT FLAT (P.L.) PANEL SHOP SHIPFIT	1.00	1220.0
796. MAKE UP STIFFENER ON (PANEL) UNIT WITH (GANTRY) AT FLAT (P.L.) PANEL SHOP SHIPFIT	3.OO	7500,0
784, TACK (STEEL) ON ASSEMBLY WITH SEMIAUTOMATIC AT ANY (SHOP) SHIPFIT	2.5O	3680,0
704, MOVE (OPERATOR) ON ASSEMBLY WITH (KNEEL) AT ANY (WORK AREA) SHIPFIT	4.00	640,0
Total TMU		13040.0

799. COMBINED SUB-OP

MAKE UP STIFFENER ON (PANEL) UNIT WITH (GANTRY) AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD DESCRIBES OPERATION OF ONE MECHANIC. MUST BE DOUBLED TO COVER BOTH OPERATORS.
PER EACH STIFFENER > 20 FT. AND < 30 FT. OFG: 3 06-AUG-82
* POSITION GANTRY, MAKE UP STIFFENER,
* TACKING BY SEMIAUTOMATIC.

TOTAL TMU 17700.0

Combined sub-operation elements	Freq.	TMU
797. POSITION (GANTRY) ON (PANEL) UNIT AT FLAT (P.L.) PANEL SHOP SHIPFIT	1.00	1220.0
796. MAKE UP STIFFENER ON (PANEL) UNIT WITH (GANTRY) AT FLAT (P.L.) PANEL SHOP SHIPFIT	4.00	10000.0
784. TACK (STEEL) ON ASSEMBLY WITH SEMIAUTOMATIC AT ANY (SHOP) SHIPFIT	3.75	5520.0
704. MOVE (OPERATOR) ON ASSEMBLY WITH (KNEEL) AT ANY (WORK AREA) SHIPFIT	6.00	960.0
Totel TMU		17700.0

800. COMBINED SUB-OF

MAKE UP STIFFENER ON (PANEL) UNIT WITH (GANTRY) AT FLAT (P.L.)
PANEL SHOP SHIPFIT
METHOD DESCRIBES THE OPERATION OF ONE MECHANIC. MUST BE DOUBLED TO
COV ER BOTH OPERATORS
PER EACH STIFFENER > 30 FT. AND) < 40 FT. OFG: 3 06-AUG-82
* POSITION GANTRY, MAKE UP STIFFENER.
* TACKING BY SEMIAUTOMATIC.

TOTAL TMU 22360.0

Combined sub-operation elements	Freq.	TMU
797. POSITION (GANTRY) ON (PANEL) UNIT AT FLAT (P.L.) PANEL SHOP SHIPFIT		
	1.00	1220.0
796. MAKE UP STIFFENER ON (PANEL) UNIT WITH (GANTRY) AT FLAT (P.L.) PANEL SHOP SHIPFIT		
	5.00	12500.0
784. TACK (STEEL) ON ASSEMBLY (WITH SEMIAUTOMATIC AT ANY (SHOP) SHIPFIT		
	5.00	7360.0
704. MOVE (OPERATOR) ON ASSEMBLY WITH (KNEEL) AT ANY (WORK AREA) SHIPFIT		
	8.00	1280.0
Total TMU		22360.0

801. COMBINED SUB-OP

MAKE UP STIFFENER ON (PANEL) UNIT WITH (GANTRY) AT FLAT (P.L.)
PANEL SHOP SHIPFIT
METHOD DESCRIBES THE OPERATION OF ONE MECHANIC, MUST BE DOUBLED TO co VER BOTH OPERATORS,
PER EACH STIFFENER > 40 FT. OFG: 3 06-AUG-82
* POSITION GANTRY, MAKE UP STIFFENER,
* TACKING BY SEMIAUTOMATIC.

TOTAL TMU 25756.0

Combined sub-oPertion elements	Freq.	TMU
797. POSITION (GANTRY) ON (PANEL) UNIT AT FLAT (P.L.) FANEL SHOP SHIPFIT	1.00	1220.0
796. MAKE UP STIFFENER ON (PANEL) UNIT WITH (GANTRY) AT FLAT (P.L.) PANEL SHOP SHIPFIT	6.00	15000.0
704. MOVE (OPERATOR) ON ASSEMBLY WITH (KNEEL) AT ANY (WORK AREA) SHIPFIT	9.00	1440.0
784. TACK (STEEL) ON ASSEMBLY WITH SEMIAUTOMATIC AT ANY (SHOP) SHIPFIT	5.50	8096.0
Total TMU		25756. 0

962. COMBINED SUB-OF

MAKE UP WEB FRAME ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD FOR WEB FRAME THAT IS 20 FT. LONG WITH 30 IN, FRAME SPACING.
W ELD FOOTAGE: BACKUP STRUCTURE - 26,25; FLAT - 32; COLLARS - 22.5.
PER TANKER WEB >6 FT. HIGH, OFG: 3 16-SEP-82
* LAND, ALIGN, MAKE UP FLAT, PLUMB,
* TACK, MAKE UP STIFFENER, INSTALL
* COLLAR,
* COUNTING COMB, SUB-OP,

TOTAL TMU 266570.3

Combined sub-operetion elements	Freq.	TMU

947. COMBINED SUB-OP

ALIGN WEB FRAME ON (PANEL) ASSEMBLY WITH JACK AT FLAT (P.L.) PANEL SHOP SHIPFIT

	i.00	7434.8

953. COMBINED SUB-OP

MAKE UP WEB FRAME (FLATS) ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT

	7.50	119043.8

957. COMBINED SUB-OP

ALIGN (BY PLUMBING) WEB FRAME ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT

	7.50	67015.5

318. MOVE OPERATOR ON UNIT WITH LADDER AT UNIT ASSEMBLY SHOP

	4.50	4896.0

960. COMBINED SUB-OP

INSTALL (KICKER) ON ASSEMBLY AT ANY (WORK AREA) SHIPFIT

	2.00	6807,0

958. COMBINED SUB-OP

ALIGN BRACKET FOR WEB FRAME AT FLAT (P.L.) PANEL SHOP SHIPFIT

7.50 43322,3

14. MOVE 2 TON WITH BOLT & CLIP AT GENERAL SHIPFIT {25}

3.00 6270.0

955. COMBINED SUB-OP

INSTALL COLLAR ON WEB FRAME AT FLAT (P.L.) PANEL SHOP SHIPFIT

7.50 11781.0

Total TMU 266570.3

963. COMBINED SUB-OF

MAKE UP WEB FRAME ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD FOR WEB THAT IS 20 FT. LONG WITH 30 IN. FRAME SPACING, WELD PO OTAGE: BACKUP STRUCTURE - 14.25; FLATS - 32.0; COLLARS - 17.4.
PER TANKER WEB < 6 FT. HIGH OFG: 3 16-SEP-82
* MAKE UP FLAT, PLUMB, MAKE UP STIFFENER,
* INSTALL COLLAR,
* COMB, SUB-OF FOR COUNTING,

TOTAL TMU 248597.3

Combined sub-operation elements Freq, TMU

953. COMBINED SUB-OF

MAKE UP WEB FRAME (FLATS) ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT

7.50 119043.8

957 l COMBINED SUB-OF

ALIGN (BY PLUMBING) WEB FRAME ON (PANEL) AT FLAT (F.L.) PANEL SHOP SHIPFIT

7.50 67015.5

958. COMBINED SUB-OP

ALIGN BRACKET FOR WEB FRAME AT FLAT (P.L.) PANEL SHOP SHIPFIT

7.50 43322.3

947. COMBINED SUB-OP

ALIGN WEB FRAME ON (PANEL) ASSEMBLY WITH JACK AT FLAT (P.L.) PANEL SHOP SHIPFIT

1.00 7434.8

955, COMBINED SUB-OP

INSTALL COLLAR ON WEB FRAME AT FLAT (P.L.) PANEL SHOP SHIPFIT

7.50 11781.0

Total TMU 248597.3

968. COMBINED SUB-OP

MAKE UP WEB FRAME ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD FOR LONGITUDINAL WEB FRAME THAT IS 40 FT. LONG WITH 8 FT. BAY S PACING, WELD FOOTAGE: FLAT - 80; VERTICAL - 120; PRE-INSTALLED DOCK1 NG BKTS, - 12; JOB INSTALLED DOCKING BKTS, - 25.5.
PER TANKER WEBS > 6 FT+ HIGH OFG: 4 20-SEP-82
* CRANE OPERATION INCLUDED DUE TO LARGE
* SIZE OF WEB, REMARK L.O. LINES, LAND
* WEB, ALIGN WEB, MAKE UP FLAT, PLUMB
* AND MAKE UP VERTICALS,
* OPERATION FOR 1 OPERATOR,

TOTAL TMU 544202.1

Combined sub-operation elements Freq. TMU

941, HARK (PANEL) FOR WEB FRAME WITH STRAIGHTEDGE AT FLAT (P.L.) PANEL SHOP SHIPFIT

40.00 9120,0

848, POSITION (OVERHEAD CRANE) ON UNIT WITH WINCH (FALL) AT OVERHEAD (CRANE) (P.L.) PANEL SHOP SHIPFIT

1.00 1476.0

943. COMBINED SUB-OP

TRANSPORT WEB FRAME FOR (PANEL) ASSEMBLY WITH (AUXILIARY FALL) AT OVERHEAD (CRANE) (P.L.) PANEL SHOP SHIPFIT

1.00 2392.0

944. UNLOAD WEB FRAME FOR (PANEL) ASSEMBLY WITH HAND AT FLAT (P.L.) PANEL SHOP SHIPFIT

2.00 1020.0

947. COMBINED SUB-OF

ALIGN WEB FRAME ON (PANEL) ASSEMBLY WITH JACK AT FLAT (P.L.) PANEL SHOP SHIPFIT

1.00 7434.8

964. COMBINED SUB-OF

MAKE UP (LONGITUDINAL) WEB FRAME ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT

1.00 86636,0

957. COMBINED SUB-OF

ALIGN (BY FLUMBING) WEB FRAME ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT

10.00 89354,0

965. COMBINED SUB-OF

MAKE UP (TRANSVERSE) WEB FRAME ON (LONGITUDINAL) WEB FRAME AT FLAT (P.L.) PANEL SHOP SHIPFIT

10.00 147709.0

966. COMBINED SUB-OF

ALIGN (DOCKING) BRACKET ON WEB FRAME AT FLAT (P.L.) PANEL SHOP SHIPFIT

3.00 36836.4

967. COMBINED SUB-OF

INSTALL (DOCKING) BRACKET ON WEB FRAME AT FLAT (P.L.) PANEL SHOP SHIPFIT

3.00 162223.8

Total TMU 544202,1

1038. COMBINED SUB-OF

INSTALL (MEDIUM SIZED KNEE) BRACKET ON WEB FRAME AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD DESCRIBES PLACING AND TACKING ONE LEG OF A 60 IN. BY 32 IN. BRA CKET. NEED CRANE FOR HANDLING+ WELD FOOTAGE = 16.7 @ 5/16. PER EACH BRACKET OFG: 4 23-SEP-82
* SET ON WEB WITH CRANE, CHECK, TACK,

TOTAL TMU 20754,0

Combined sub-operation elements	Freq,	TMU
960. COMBINED SUB-OP		
INSTALL (KICKER) ON ASSEMBLY AT ANY (WORK AREA) SHIPFIT	4.00	13614.0
692. INSTALL BRACKET ON (HOUSE SIDE) AT (INVERTED ALUMINUM) UNIT ASSEMBLY SHOP SHIPFIT	1.00	460.0
848. POSITION (OVERHEAD CRANE) ON UNIT WITH WINCH (FALL) AT OVERHEAD (CRANE) (P.L.) PANEL SHOP SHIPFIT	1.00	1476.0
943. COMBINED SUB-OP		
TRANSPORT WEB FRAME FOR (PANEL) ASSEMBLY WITH (AUXILIARY FALL) AT OVERHEAD (CRANE) (P.L.) PANEL SHOP SHIPFIT	1.00	2392. 0
944. UNLOAD WEB FRAME FOR (PANEL) ASSEMBLY WITH HAND AT FLAT (P.L.) PANEL SHOP SHIPFIT	1.00	510.0
793. ALIGN STIFFENER ON (PANEL) UNIT WITH (SLEDGE) HAMMER AT FLAT (P.L.) PANEL SHOP SHIPFIT	1.00	830. 0
784. TACK (STEEL) ON ASSEMBLY WITH SEMIAUTOMATIC AT ANY (SHOP) SHIPFIT	1.00	1472.0
Total TMU		20754,0

1039. COMBINED SUB-OP

INSTALL (LARGE KNEE) BRACKET ON WEB FRAME AT FLAT (P,L.) PANEL SHOP SHIPFIT
METHOD DESCRIBES PLACING AND TACKING ON ONE LEG OF AN EIGHT BY EIGHT F T. KNEE BRACKET, NEED CRANE FOR HANDLING. WELD FOOTAGE = 18 @ 5/16.
PER EACH BRACKET OFG: 4 23-SEP-82
* SET ON WEB WITH CRANE; ALIGN AND
* MAKE UP,

TOTAL TMU 46759.0

Combined sub-operation elements	FreQ,	TMU
960. COMBINED SUB-OP		
INSTALL (KICKER) ON ASSEMBLY AT ANY (WORK AREA) SHIPFIT	7.00	23824,5
692. INSTALL BRACKET ON (HOUSE SIDE) AT (INVERTED ALUMINUM) UNIT ASSEMBLY SHOP SHIPFIT	2.00	920.0
848. POSITION (OVERHEAD CRANE) ON UNIT WITH WINCH (FALL) AT OVERHEAD (CRANE) (P.L.) PANEL SHOP SHIPFIT	1.00	1476.0
943. COMBINED SUB-OP		
TRANSPORT WEB FRAME FOR (PANEL) ASSEMBLY WITH (AUXILIARY FALL) AT OVERHEAD (CRANE) (P.L.) PANEL SHOP SHIPFIT	1.00	2392.0
944. UNLOAD WEB FRAME FOR (PANEL) ASSEMBLY WITH HAND AT FLAT (P.L.) PANEL SHOP SHIPFIT	0.10	51.0
947. COMBINED SUB-OP		
ALIGN WEB FRAME ON (PANEL) ASSEMBLY WITH JACK AT FLAT (P.L.) PANEL SHOP SHIPFIT	0.75	5576.1
957. COMBINED SUB-OP		

ALIGN (BY PLUMBING) WEB FRAME ON (PANEL) AT FLAT (F.L.) PANEL SHOP SHIPFIT

1.00 8935.4

784. TACK (STEEL) ON ASSEMBLY WITH SEMIAUTOMATIC AT ANY (SHOP) SHIPFIT

2.00 2944.0

705. HOVE (OPERATOR) ON ASSEMBLY WITH (CLIMB-OBJECT) AT ANY (WORK AREA) SHIPFIT

2.00 640.0

Total TMU 46759,0

1032. COMBINED SUB-OF

INSTALL (LARGE) HEADER ON (PANEL) AT FLAT (P.L,) PANEL SHOP SHIPFIT
HEADER LARGE AND NEEDS CRANE TO BE HANDLED, WELD FOOTAGE: 8 FT. PER EACH HEADER OFG: 4 23-SEP-82
* FITTER LOCATES HEADER POSITION; SETS
* JIG; TRANSFERS LINES TO HEADER; HAS
* HEADER TRIMMED; THEN ALIGNS AND TACKS
* HEADER.

TOTAL TMU 23120.0

Combined sub-operation elements FreQ. TMU

848. POSITION (OVERHEAD CRANE) ON UNIT WITH WINCH (FALL) AT OVERHEAD (CRANE) (P.L.) PANEL SHOP SHIPFIT

1.OO 1476.0

943. COMBINED SUB-OF

TRANSPORT WEB FRAME FOR (PANEL) ASSEMBLY WITH (AUXILIARY FALL) AT OVERHEAD (CRANE) (P.L.) PANEL SHOP SHIPFIT

2.OO 2392. 0

944. UNLOAD WEB FRAME FOR (PANEL) ASSEMBLY WITH HAND AT FLAT (P.L.) PANEL SHOP SHIPFIT

1.00 510.0

721. MARK ASSEMBLY FOR FOUNDATION (LOCATION) AT ANY (WORK AREA) SHIPFIT

	1.00	6120.0
739. MEASURE HEADER ON UNIT WITH (ADJUSTABLE) JIG AT (INVERTED ALUMINUM) UNIT ASSEMBLY SHOP SHIPFIT		
	1.00	2370.0
952. FLAME CUT (STEEL) FOR (BURNING PROCESS) WITH TORCH AT ANY (WORK AREA) SHIPFIT		
	1.00	5004.0
740. ALIGN HEADER ON ASSEMBLY AT (INVERTED ALUMINUM) UNIT ASSEMBLY SHOP SHIPFIT		
	2.00	2240.0
614. MOVE (OPERATOR) ON ASSEMBLY AT ANY LAYOUT AREA SHIPFIT		
	100.00	800.0
784. TACK (STEEL) ON ASSEMBLY WITH SEMIAUTOMATIC AT ANY (SHOP) SHIPFIT		
	1.50	2208.0
Total TMU		23120.0

291. COMBINED SUB-OP

MAKE UP VERTICAL SEAM IN BULKHEAD WITH DOG & WEDGE AT UPPER ASSEMBLY SHOP SHIPFIT
COMPLETE
PER FOOT OFG: 2 04-NOV-81
* 10 FT

UNIT

TOTAL TMU 5830,0

Combined sub-operation elements	FreQ.	TMU
290. MAKE UP VERTICAL SEAM IN BULKHEAD WITH DOG & WEDGE AT UPPER UNIT ASSEMBLY SHOP SHIPFIT	1.00	2040.0
15. HOVE 5 TON IN DOWNHAND POSITION WITH DOG AND WEDGE AT GENERAL SHIPFIT {25}	1.OO	1590.0
289, HOVE PLATE ON PANEL WITH STRONGBACK AT ANY WORK AREA SHIPFIT	0.50	2200.0
Total TMU		5830.0

WHOLE PANEL LINE FITTING COUNT

Titlesheet Organization List

Assemble/Disassemble

888 . COMBINED SUB-OP

POSITION PLATES FOR (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD ALLOWS FOR COUNTING AT SEAM-FITTING GANTRY.

880. COMBINED SUB-OP

MARK (PANEL) PLATE FOR (LAYOUT) AT ANY (P.L.) PANEL SHOP SHIPFIT
METHOD USED FOR PANEL LAYOUT ON PANEL LINE.

798. COMBINED SUB-OP

MAKE UP STIFFENER ON (PANEL) UNIT W1TH (GANTRY) AT FLAT (P.L*)
PANEL SHOP SHIPFIT
METHOD DESCRIBES OPERATION OF ONE MECHANIC, MUST BE DOUBLED TO COVER B
OTH OPERATORS.

799. COMBINED SUB-OP

MAKE UP STIFFENER ON (PANEL) UNIT WITH (GANTRY) AT FLAT (P.L.)
PANEL SHOP SHIPFIT
METHOD DESCRIBES OPERATION OF ONE MECHANIC, MUST BE D0UBLED TO COVER B
OTH OPERATORS.

Join

1043. COMBINED SUB-OP

MAKE READY OPERATOR FOR (PANEL) ASSEMBLY AT FLAT (P.L.) PANEL SHOP
SHIPFIT
METHOD FOR TOTAL PREP TIME FOR FOR PANEL.

891. COMBINED SUB-OP

MAKE UP (THIN) PLATES FOR (PANEL) AT FLAT (P.L,) PANEL SHOP
SHIPFIT
METHOD ALLOWS FOR COUNTING AT SEAM-FITTING GANTRY.

882. COMBINED SUB-OP

MEASURE (PANEL) PLATE FOR (LAYOUT) AT ANY (P.L.) PANEL SHOP SHIPFIT
METHOD USED FOR 18 INCH FRAME SPACING AND 8 FOOT WEB SPACING,

1034. COMBINED SUB-OP

HAKE UP (TRANSVERSE) WEB FRAME ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD FOR COMPLETE MANUAL MAKE UP OF 12 IN, WEB @ 40 FT. LENGTH, 27 STIFFENER C/O'S AND 18 IN. FRAME SPACING, WELD FOOTAGE: FLAT -65; T I E-BUTT - 3,5; STIF+ FACEPLATES- 18; COLLARS - 90; SMALL BK

1033. COMBINED SUB-OP

INSTALL (KNEE) BRACKET ON WEB FRAME AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD DESCRIBES PLACING AND TACKING BRACKET ON ONE LEG ONLY, CAN BE HANDLED MANUALLY. 3 FT. OF WELD.

756. COMBINED SUB-OP

INSTALL HEADER ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT
HEADER SHALL AND LIGHT ENOUGH TO BE EASILY HANDLED MANUALLY.

Operate

1044. COMBINED SUB-OP

MAKE READY OPERATOR FOR (PANEL) ASSEMBLY AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD FOR TOTAL PREP TIME FOR TANKER PANEL,

1053. COMBINED SUB-OP

MAKE UP PLATES FOR (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD ALLOWS FOR COUNTING AT SEAM-FITTING GANTRY.

881. COMBINED SUB-OP

MEASURE (PANEL) PLATE FOR (LAYOUT) AT ANY (P.L.) PANEL SHOP SHIPFIT
METHOD USED FOR 30 INCH FRAME SPACING AND 8 FOOT WEB SPACING.

800. COMBINED SUB-OP

MAKE UP STIFFENER ON (PANEL) UNIT WITH (GANTRY) AT FLAT (P.L.)
PANEL SHOP SHIPFIT
METHOD DESCRIBES THE OPERATION OF ONE MECHANIC, MUST BE DOUBLE TO COV
ER BOTH OPERATORS

801. COMBINED SUB-OP

MAKE UP STIFFENER ON (PANEL) UNIT WITH (GANTRY) AT FLAT (F.L.)
PANEL SHOP SHIPFIT
METHOD DESCRIBES THE OPERATION OF ONE MECHANIC, MUST BE DOUBLED TO CO
V
ER BOTH OPERATORS,

962. COMBINED SUB-OP

MAKE UP WEB FRAME ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD FOR WEB FRAME THAT IS 20 FT. LONG WITH 30 IN. FRAME SPACING. W
E
LD FOOTAGE: BACKUP STRUCTURE - 26.25; FLAT - 32; COLLARS - 22.5.

963. COMBINED SUB-OP

MAKE UP WEB FRAME ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD FOR WEB THAT IS 20 FT. LONG WITH 30 IN. FRAME SPACING, WELD FO

TAGE: BACKUP STRUCTURE - 14.25; FLATS - 32,0; COLLARS - 17,4,

968. COMBINED SUB-OP

MAKE UP WEB FRAME ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT
METHOD FOR LONGITUDINAL WEB FRAME THAT IS 40 FT. LONG WITH 8 FT. BAY S
PACING, WELD FOOTAGE: FLAT - 80; VERTICAL - 120; PRE-INSTALLED DOCKI N
G BKTS. - 12; JOB INSTALLED DOCKING BKTS, - 25.5.

1038. COMBINED SUB-OP

INSTALL (MEDIUM SIZED KNEE) BRACKET ON WEB FRAME AT FLAT (P.L.)
PANEL SHOP SHIPFIT
METHOD DESCRIBES PLACING AND TACKING ONE LEG OF A 60 IN. BY 32 IN. BRA
CKET. NEED CRANE FOR HANDLING. WELD FOOTAGE = 16.7 @ 5/16.

1039. COMBINED SUB-OP

INSTALL (LARGE KNEE) BRACKET ON WEB FRAME AT FLAT (P.L.) PANEL
SHOP SHIPFIT
METHOD DESCRIBES PLACING AND TACKING ON ONE LEG OF AN EIGHT BY EIGHT F
T. KNEE BRACKET. NEED CRANE FOR HANDLING, WELD FOOTAGE = 18 @ 5/16.

1032. COMBINED SUB-OF

INSTALL (LARGE) HEADER ON (PANEL) AT FLAT (P.L.) PANEL SHOP SHIPFIT
HEADER LARGE AND NEEDS CRANE TO BE HANDLED, WELD FOOTAGE: 8 FT.

291. COMBINED SUB-OP

MAKE UP VERTICAL SEAM IN BULKHEAD WITH DOG & WEDGE AT UPPER ASSEMBLY SHOP SHIPFIT UNIT
COMPLETE

SECTION 1.3.2
HOW TO CALCULATE TIME STANDARDS

M O S T OPERATION TIME CALCULATION

DETAIL/UNIT/PART	3021-STBD,	REV. LTR/DATE	X
PROCESS/OPER CODE	INNERBOTTOM	STANDARD CODE	PROD
PART NAME	LONG-BHD,		
SHIP CLASS	FALCON	HULL	404
COST CLASS/JOB #	PANEL LINE	TRADE	SHIPFIT
GROUP (UNIT/ZONE)	3020	WORK AREA	x
SUB-GROUP	3021	WORK ZONE	x
SUB-SUB-GROUP	x	WORK CENTER	PNL.LN
CREW/MACHINE	1-2	ASSET/MACHINE	x
I T E M	GIRTH	SUB-ITEM	STBD.
GEN. DRAWING	200-3030	WORK ORDER	x
DET, DRAWING	x	SHEET	x
WORK PACKAGE	x	APPLICATOR	MWC
OPER, DESCRIPTION	FIT BHD, ASSY, AND SHELL ASSY. THEN BHD. TO SHELL.		
	STBD, SHOWN, PORT IS SIMILAR BUT OPPOSITE.		
DATE	17-NOV-82	ISSUE #	3

Step	Method	Instruction		FreQ
1	POSITION	PLATES FOR (PANEL)	(888)	0
	* SET PLATES, ATTACH GROUND, HAKE 1ST.			
	* TACK. ALLOWS USING LUG-ALL.			
	* FREQ, = 1 PER PANEL SEAM			
2	MARK	(PANEL) PLATE FOR (LAYOUT)	(880)	447
	* FREQ, = TOTAL LINEAR FOOTAGE OF WEBS			
	* AND STIFFENERS.			
3	MAKE UP	STIFFENER ON (PANEL) UNIT WITH (GANTRY)	(798)	0
	* POSITION GANTRY, MAKE UP STIFFENER.			

```
    * TACKING BY SEMIAUTOMATIC.
    * FREQ, = TWICE THE NUMBER OF STIFFENERS
    * AT THIS LENGTH,
 4  MAKE UP STIFFENER ON (PANEL) UNIT WITH (GANTRY)( 799)
    * POSITION GANTRY, MAKE UP STIFFENER.
    * TACKING BY SEMIAUTOMATIC,
    * FREQ, = TWICE THE NUMBER OF STIFFENERS
    * AT THIS LENGTH.
 5  MAKE READY OPERATOR FOR (PANEL) ASSEMBLY       ( 1043)        0
    * FREQ, = 1 PER PANEL.
 6  MAKE UP (THIN) PLATES FOR (PANEL)              ( 891)         0
    * MAKE UP FOR PLATES LESS THAN OR EQUAL
    * TO .375 IN, OR 15.3 LBS.
    * FREQ.= TOTAL SEAM FOOTAGE.
 7  MEASURE (PANEL) PLATE FOR (LAYOUT)             ( 882)         0
    * 1 MARK / 2.4 FEET.
    * FREQ. = TOTAL PERIMETER FOOTAGE.
 8  MAKE UP (TRANSVERSE) WEB FRAME ON (PANEL)      ( 1034)        0
    * FREQ. = TWICE THE NUMBER OF WEBS OF THIS
    * TYPE,
 9  INSTALL (KNEE) BRACKET ON WEB FRAME            ( 1033)        0
    * SET ON WEB, CHECK, TACK.
    * FREQ, = i PER BRACKET.
10  INSTALL HEADER ON (PANEL)                      ( 956)         0
    * FITTER LOCATES HEADER POSITION; SETS
    * JIG; TRANSFERS LINES TO HEADER; HAS
    * HEADER TRIMMED; THEN ALIGNS AND TACKS
    * HEADER.
    * FREQ, = 1 PER HEADER.
11  MAKE READY OPERATOR FOR (PANEL) ASSEMBLY       ( 1044)        0.5
    * FREQ, = 1 PER PANEL.
12  MAKE UP PLATES FOR (PANEL)                     ( 1053)        0
    * MAKE UP FOR PLATES GREATER THAN
    * .375 IN, OR 15.3 LBS.
    * FREQ, = TOTAL SEAM FOOTAGE.
13 MEASURE (PANEL) PLATE FOR (LAYOUT)              ( 881)         324
    * 1 MARK / 4 FEET.
    * FREQ, = TOTAL FOOTAGE OF PERIMETER.
14  MAKE UP STIFFENER ON (PANEL) UNIT WITH (GANTRY)( 800)         0
    * POSITION GANTRY, MAKE UP STIFFENER.
    *  TACKING BY SEMIAUTOMATIC.
    * FREQ, = TWICE THE NUMBER OF STIFFENERS
    * AT THIS LENGTH.
15  MAKE UP STIFFENER ON (PANEL) UNIT WITH (GANTRY)( 80i)         14
    * POSITION GANTRY, MAKE UP STIFFENER,
    * TACKING BY SEMIAUTOMATIC.
    * FREQ, = 2PER EACH STIFFENER THIS LENGTH
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     *
i6 MAKE UP WEB FRAME ON (PANEL)                    ( 962)        0
     * LAND, ALIGN, MAKE UP FLAT, PLUMB,
     * TACK, MAKE UP STIFFENERS INSTALL
     * COLLAR.
     * COUNTING COMB, SUB-OP.
     * FREQ, = 2 PER EACH WEB OF THIS TYPE,
17 MAKE UP WEB FRAME ON (PANEL)                    ( 963)        6
     * MAKE UP FLAT, PLUMB, MAKE UP STIFFENER.
     * INSTALL COLLAR.
     * COMB, SUB-OF FOR COUNTING.
     * FREQ, = 2 PER EACH WEB OF THIS TYPE.
i8 MAKE UP WEB FRAME ON (PANEL)                    ( 968)        2.2
     * CRANE OPERATION INCLUDED DUE TO LARGE
     * SIZE OF WEB, REMARK L.O. LINES, LAND
     * WEB, ALIGN WEB, MAKE UP FLAT, PLUMB
     * AND MAKE UP VERTICALS.
     * OPERATION FOR 1 OPERATOR,
     * FREQ, = 2 PER EACH WEB OF THIS TYPE.
19 INSTALL (MEDIUM SIZED KNEE) BRACKET ON WEB FRAM( i038)        8
     E    l

     * FREQ, = 2 PER EACH BRACKET OF THIS TYPE.
     *
20 INSTALL (LARGE KNEE) BRACKET ON WEB FRAME       ( 1039)        0
     * FREQ, = 2 PER EACH BRACKET OF THIS TYPE.
     *
21 INSTALL (LARGE) HEADER ON (PANEL)               ( 1032)        0
     * FITTER LOCATES HEADER POSITION; SETS
     * JIG; TRANSFERS LINES TO HEADER; HAS
     * HEADER TRIMMED; THEN ALIGNS AND TACKS
     * HEADER,
     * FRED, = 1 PER EACH HEADER.
22 MAKE UP VERTICAL SEAM IN BULKHEAD WITH DOG & WE( 291)        0
     DGE

     * 10 FT
     * FREQ, = TOTAL FOOTAGE OF VERTICAL SEAM,
     *
23 MISC, SMALL PARTS SUCH AS LADDER RUNGS, FAD EYES( )          6
     , ETC.

     * FREQ, = 1 PER EACH SMALL MISC, PART.
```

M O S T OPERATION TIME CALCULATION

STEP	SA	FREQ	INTERNAL TMU	EXTERNAL TMU	LOC #
1	0.00	0.00		0.	888
2	0.00	447.00		i06833.	880
3	0.11	0.00		0.	798
4	0.il	0.00		0.	799
5	0.00	0.00		0.	1043
6	0.00	0.00		0.	891
7	0.00	0.00		0.	882
8	0.00	0.00		0.	1034
9	0.00	0.00		0.	1033
10	0.00	0.00		0.	956
11	0.00	0.50		374207.	1044
12	0.00	0.00		0.	1053
13	0.00	324.00		49734.	881
14	0.il	0.00		0.	800
15	0.11	14.00		400248.	801
16	0.00	0.00		0.	962
17	0.00	6.00		1491584.	963
18	0.00	2.20		1197245.	968
19	0.00	8.00		166032.	1038
20	0.00	0.00		0.	1039
21	0.00	0.00		0.	1032
22	0.00	0.00		0.	291
23	0.00	6.00		150000.	0
			---	---	
MANUAL TIME(TMU)			0.	3935882.	
ACTUAL PROCESS TIME(TMU)			0.	0.	
FACTORED PROCESS TIME(TMU)			0.		
TOTAL INTERNAL TIME(TMU)			0 .		

TITLE SHEET USED IN SETTING STANDARD: O

M O S T OPERATION TIME CALCULATION

Engineered Operation Time Calculation

Type of Work	Elemental Time	Percent Allowance	Allowance Time	Standard Time
EXTERNAL MANUAL	39.359		0.000	39.359
ASSIGNED INTERNAL	(0.000)	()	(0.000)	(0.000)
PROCESS TIME	0.000		0.000	0.000
STANDARD(HRS./CYCLE)	39,359		0.000	39.359
PIECES PER CXCLE	1			
STANDARD HOURS				39.4

COMPUTERIZED STANDARDS BACKUP DATA

WELDING OPERATIONS

Pages 110 - 167

174, PREPARE & STRIKE ARC FOR MANUAL (STICK) WELDING AT ANY SHIP OR SHOP AREA WELDING
PER ELECTRODE OFG: 1 14-SEP-81
THE WELDER IS IN POSITION TO WELD AND WITHIN REACH OF WHERE THE ARC WILL BE STRUCK. .
* WELDER REPOSITIONS BODY EVERY 4TH WELD
WELDER BEGINS AT JOB

1 INSPECT 1 POINT ON THE JOINT			
AO BO GO AO BO PO T1 AO BO PO AO	1.00	10.
2 MANEUVER SELF AT JOB (REPOSITION BODY) F .25			
A1 BO G1 M10 XO IO AO	0.25	30.
3 HOLD+MOVE ELECTRODE HOLDER TO JOB (NEAR WHERE THE ARC WILL BE STRUCK IN THE JOINT)			
AO B0 GO A1 BO P1 AO	1.00	20.
4 SHUT HELMET WITH HAND			
A1 BO G1 M3 XO 1O AO	1.00	50.
5 HOLD+PUSH THE ELECTRODE HOLDER FOR STARTING AN ARC IN THE JOINT			
A0 B0 G0 M1 XO IO AO	1.00	10.
	TOTAL TMU	120 l

178, PREPARE+STRIKE ARC FOR ARC GOUGING WITH CARBON AT ANY SHOP WELDING AREA PER ELECTRODE OFG: 1 14-SEP-81

OPERATOR IS ALL SET UP AT THE JOB LOCATION
* UNLIKE STICK WELD ELECTRODE.
* THE OPERATOR MUST STRIKE SEVERAL ARCS
* BEFORE THE ELECTRODE IS CONSUMED,
* A 2 INCH STUB IS ALLOWED.
* IT IS ESTIMATED THAT 4 STRIKES WILL
* BE MADE PER ELECTRODE.
* SIZE OF THE CARBON ELECTRODE IS NOT
* THOUGHT TO HAVE ANY SIGNIFICANT EFFECT
* ON THIS FREQUENCY.

WELDER BEGINS AT JOB

1	INSPECT THE JOINT AT 4 POINTS F4 AO B0 GO AO BO PO T6 AO BO PO AO	4.00	240.
2	HOLD+MOVE THE ELECTRODE HOLDER TO THE JOINT AT THE JOB (NEAR THE POINT OF STRIKING AN ARC) F 4 AO BO GO A1 BO P1 AO	4.00	80.
3	CLOSE+PRESS THE BUTTON AT THE ELECTRODE HOLDER FOR STARTING THE AIR F 4 AO BO G1 H3 XO IO AO	4.00	160.
4	SHUT THE HOOD AT THE WELDER ‘S HEAD F 4 Al BO G1 H3 XO IO AO	4.00	200.
5	OPEN THE HOOD AT THE WELDER ‘S HEAD F 4 Al BO G1 M3 XO IO AO	4.00	200.
6	CLOSE+PRESS THE BUTTON ON THE ELECTRODE HOLDER FOR SHUTTING OFF THE AIR F4 AO BO G1 M3 XO IO AO	4.00	160.
7	HOLD+MOVE ELECTRODE HOLDER FROM JOB TO SELF F 4 AO BO GO A1 BO P1 AO	4.00	80.
8	0FEN+SHUT ELECTRODE HOLDER F 4 Al BO G1 H6 XO IO AO	4.00	320.
9	PUSH CARBON ELECTRODE AT ELCETRODE HOLDER F 4 Al BO G1 M1 XO IO AO	4.00	120.
10	HOLD+MANEUVER BODY AT JOB PRIOR-TO STRIKING THE NEXT ARC F 4 AO BO GO M1O XO IO AO	4.00	400.

TOTAL TMU 1960.

186. CLEAN WELD JOINT ON ASSEMBLY WITH PICK AND WIRE-BRUSH AT ANY SHOP AREA
WELDING
PER ELECTRODE OFG: 2 08-SEP-81
INCLUDES WIRE-BRUSHING
WELDER BEGINS AT JOB

1 PUSH HOOD UP AT WELDER 'S HEAD			
A1 BO G1 H1 XO IO AO	1.00	30.
2 HOLD+MOVE ELECTRODE HOLDER FROM WELDER TO THE WIREBOX			
AO BO GO A1 BO P1 AO	1.00	20.
3 LOOSEN THE SLAG ON THE WELD AT THE JOB WITH 6 STRIKES USING THE PICK AT THE JOB AND RETURN			
A1 BO G1 A1 B0 PO L16 Al BO P1 AO	1.00	210.
4 PICKUP+HOLD THE WIRE-BRUSH			
A1 BO G1 A1 B0 PO AO	1.00	30.
5 BRUSHCLEAN THE WELD AT THE JOB .5 SQ.FT. USING WIRE-BRUSH AT THE JOB AND RETURN			
A1 BO G1 A1 BO P1 S6 A1 BO P1 AO	1.00	120.
6 INSPECT 4 POINTS			
AO BO GO AO BO PO T6 AO BO PO AO	1.00	60.
7 PICKUP+HOLD ELECTRODE HOLDER			
A1 B0 G1 A1 BO PO AO	1.00	30.
	TOTAL TMU	500.

188. CLEAN WELD JOINT ON ASSEMBLY WITH PICK AND WIRE-BRUSH AT ANY SHOP WELDING AREA
PER INCREMENT (18 INCHES) OF WELD OFG: 2 14-SEP-81
* INCLUDES WIRE-BRUSHING
WELDER BEGINS AT JOB

1	PUSH HOOD UP AT WELDER 'S HEAD Al B0 G1 H1 XO IO AO	1.00	30.
2	HOLD+MOVE ELECTRODE HOLDER FROM WELDER TO THE WIREBOX AO BO GO Al BO P1 AO	1.00	20.
3	LOOSEN THE SLAG ON THE WELD AT THE JOB WITH 6 STRIKES USING THE PICK AT THE JOB AND RETURN Al BO G1 Al EO PO L16 Al EO Pi AO	i.00	210.
4	PICKUP+HOLD THE WIRE-BRUSH Al BO G1 Al BO PO AO	1.00	30.
5	BRUSHCLEAN THE WELD AT THE JOB .5 SQ.FT. USING WIRE-BRUSH AT THE JOB AND RETURN A1 BO G1 A1 BO F1 S6 A1 BO P1 AO	1.00	120.
6	INSPECT 4 POINTS AO BO GO AO BO PO T6 AO BO PO AO	1.00	60.
7	PICKUP+HOLD ELECTRODE HOLDER A1 BO G1 A1 BO PO AO	1.00	30.

- TOTAL TMU 500 l

366. WELD GOUGE ON ASSEMBLY WITH SEHIAUTOMATIC AT VERTICAL UNIT ASSEMBLY SHOP WELDING
PER 100 FEET OFG: 2
WELD GOUGE-2-A-5/l6...ASSEMBLY BUILDING...S727ANVIGO05W

1 l/8'X5/16' GROOVE PLUS OVERWELD VERTICAL WITH SEMIAUTOMATIC AT THE A.B.

TOTAL TMU 1526268.

378. WELD GOUGE ON ASSEMBLY WITH SEMIAUTOMATIC AT VERTICAL UNIT ASSEMBLY SHOP WELDING
PER 100 FEET OFG: 2
WELD GOUGE-2-A-5/16...ASSEMBLY BUILDING...S727ANVIGO05W

1 l/8′X5/16[1] GROOVE PLUS OVERWELD VERTICAL WITH SEMIAUTOMATIC AT THE A.B.

TOTAL TMU 1526268.

382. GOUGE BUTT ON ASSEMBLY WITH CARBON ELECTRODE AT ANY UNIT ASSEMBLY SHOP WELDING
PER 100 FEET OFG: 2
GOUGE BV.l-AGOUGE-5/16...ASSEMBLY BUILDING...GOUGE-1-A

1 1/8′X5/16′ GROOVE MADE WITH 5/16′ CARBON ELECTRODE AT THE A.B.

TOTAL TMU 484213.

425. REPOSITION OBJECT ON ASSEMBLY AT UNIT ASSEMBLY SHOP WELDING
PER EACH OFG: 3 19-JAN-82
MOVING ITEMS AT THE JOB SITE.
* FOR SHORT MOVES...
* AS FROM ONE SIDE OF A WEB TO THE OTHER.
* FOR MOVING ANY OF THE TOOLS A WELDER...
*...MIGHT BE USING EXCEPT A WIREFEEDER,
WELDER BEGINS AT WELD-AREA

1 MOVE OBJECT FROM JOB TO JOB WITH CRAWL
Al B0 GI Al B24 P1 A0 1.00 280.

TOTAL TMU 280.

429. REPOSITION OBJECT ON ASSEMBLY AT UNIT ASSEMBLY SHOP WELDING
PER EACH OFG: 3 18-JAN-82
FOR SHORT MOVES AT THE JOB SITE.
* IN A CONJESTED AREA.
* FOR EXAMPLE, AS TO MOVE AROUND PIPING.
WELDER BEGINS AT WELD-AREA

1 MOVE OBJECT FROM JOB TO JOB WITH CRAWL-COMPLEX
A1 BO G1 A1 B32 P1 A0 1.00 360.

TOTAL TMU 360.

432. WELD B2V.1AP ON ASSEMBLY WITH SEMIAUTOMATIC AT VERTICAL UNIT ASSEMBLY SHOP WELDING
PER 100 FEET OFG: 2
1/2´ V-BUTT VERTICAL WITH SEMIAUTOMATIC AT THE A.B.

1 WELD B2V.1AP-1/4...ASSEMBLY BUILDING...S727AGVlGO05W

TOTAL TMU 1268665.

439. WELD B2V,1AP ON ASSEMBLY WITH STICK ELECTRODE AT VERTICAL UNIT ASSEMBLY SHOP WELDING
PER 100 FEET OFG: 2
5/16′ V-BUTT VERTICAL WITH 7018 ELECTRODE AT THE A.B.

1 WELD B2V.1AP-1/4...ASSEMBLY BUILDING...B2V.1A7018VOO0

TOTAL TMU 2417813.

590. CLEAN WELDMENT ON ASSEMBLY WITH BRUSH (AND PICK) AT ANY (WORK AREA)
PANEL SHOP (PANEL LINE) WELDING
PER 1 FOOT OFG: 2 16-APR-82
FOR MULTI TRIP WELDS USE (TX L X C = CLEANING TIME)
* THIS INCLUDES WIRE-BRUSHING, LIFTING
* AND LOWERING THE HOOD, AND MOVING THE
* VENT-TUBE.
WELDER BEGINS AT WEB

1	MOVE WIREBRUSH AND PICK AND) HOOD TO THE TOOLTRAY PF 3 (3 4 5 6) F 1 / 100		
	A1O BO (GI A1 BO F1)AO (3)	0.01	2.
2	GET+MOVE TOOLTRAY TO THE WEB WITH KNEEL F 1 / 100		
	A1 BO G3 A1O BI6 F1 AO	0.01	3.
3	PUSH HOOD UP AT WELDER ‘S HEAD		
	A1 BO G1 M1 XO IO AO	1.OO	30.
4	HOLD+MOVE GUN FROM WELDER TO TOOLTRAY		
	AO BO GO Al BO F1 AO	1.00	20.
5	LOOSEN THE SLAG ON THE WELD AT THE WEB WITH 6 STRIKES USING THE PICK AND RETURN		
	A1 B0 G1 A1 BO FO L16 A1 BO P1 AO	1.00	210.
6	BRUSHCLEAN THE WELD AT THE WEB .5 SQ.FT. USING THE WIREBRUSH AND RETURN		
	Al BO G1 A1 BO P1 S6 A1 BO F1 AO	1.00	i20.
7	INSPECT 4 POINTS		
	AO BO GO AO BO TO T6 AO BO PO AO	1.OO	60.
8	PICKUP+HOLD GUN		
	Al BO G1 A1 BO FO AO	1.00	30.
	TOTAL TMU		475.

595. COMBINE HELMET (HOOD AND HARDHAT) AT ANY (WORK STATION) PANEL SHOP (PANEL LINE) WELDING

PER EACH OCCURANCE OFG: 4 19-APR-82
GEAR WAS MOVED) TO THE ASSEMBLY AT THE BEGINNING OF THE SHIFT,
* THE HARDHAT SHOLD BE ALREADY ON THE
* WELDER'S HEAD,
* THE HOOD IS USUALLY IN THE TOOL-BAG,
* BUT IS NOT DIFFICULT TO GET OUT,
* NORMALLY THE WELDER WOULD DISASSEMBLE
* THE HELMET AT EACH BREAK (COFFEE BREAK
* AND LUNCH BREAK) AS WELL AS EACH TIME
* HE MOVES THE SEMIAUTOMATIC OR GOES FOR
* A NEW ROLL OF WIRE,(ALSO WHEN THE GANTRY
* OR THE UNIT IS MOVED,)
WELDER BEGINS AT UNIT

1 MOVE HOOD FROM TOOL-BAG TO UNIT			
A1 B0 G1 A1 BO P1 AO	1.00	40.
2 PLACE HARTDHAT TO THE HOOD			
A1 BO G1 A1 BO P3 AO	1.00	60.
3 CLOSE+PUSH THE LOCKING PINS ON THE HARDHAT AT THE HOOD (LOCK IN PLACE) F 2			
AO BO G1 H1 XO IO AO	2.00	40.
4 WIPE LENS AT HOOD .5 SQ.FT. USING HAND			
A1 BO G1 A1 BO P1 S3 AO BO PO AO	1.OO	70.
5 HOLD+PLACE HOOD ON TO THE WELDER 'S HEAD			
AO BO GO A1 BO P3 AO	1.00	40.
6 REMOVE HOOD FROM THE WELDER 'S HEAD TO THE UNIT			
A1 BO G1 A1 BO P1 AO	1.OO	40.
7 CLOSE+PUSH THE LOCKING PIN ON THE HARDHAT AT THE HOOD (UNLOCK) F 2			
AO BO G1 M1 XO I0 AO	2.00	40.
8 HOLD+MOVE HARDHAT ON TO THE WELDER 'S HEAD			
AO BO GO A1 BO P1 AO	1.00	20.
9 MOVE HOOD TO TOOL-BAG			
A1 BO G1 A1 BO P1 AO	1.00	40.
	TOTAL TMU	390.

608. ARRANGE GLOVES (MITTENS) ON ASSEMBLY AT ANY (WORK AREA) PANEL SHOP (PANEL LINE) WELDING
PER EACH OCCURANCE OFG: 4 19-AFR-82
THIS OCCURS DURING THE SHIFT.
* THE GLOVES ARE ALREADY OUT
* OF THE TOOLBAG,
* SIMPLY PICK THE UP AND) PUT THEM ON.
* LATER LAY THEM ASIDE AT EITHER THE
* JOB SIGHT OR THE WIREBOX.
WELDER BEGINS AT WEB

1 PICKUP+HOLD GLOVES			
	A1O BO G1 Al B0 P0 A0	1.00	120.
2 HOLD+PLACE GLOVE ON TO WELDER ‘S HAND F 2			
	AO BO GO Al B0 P3 A0	2.00	80.
3 REMOVE GLOVE FROM WELDER ‘S HAND TO TOOL TRAY F 2			
	A1 B0 G1 A1 B0 P1 A0	2.00	80.
		TOTAL TMU	280.

719. WELD B2V.1AP (7/16’ GROOVE JOINT) ON ASSEMBLY WITH SEMIAUTOMATIC AT (STEEL) UNIT ASSEMBLY SHOP WELDING
PER 1OO,O FEET OFG: 2
B2V.1AP-1/4...S727AGV1GOOW

1 7/16’ GROOVE JOINTOINT.

TOTAL TMU 1159131.

746. ARRANGE GLOVES (MITTENS) ON ASSEMBLY (AT TOOL-BAG) AT ANY (WORK STATION) PANEL SHOP (PANEL LINE) WELDING
PER SHIFT OFG: 4 23-JUL-82
TAKE GLOVES OUT OF BAG AT START OF SHIFT AND RETURN THEM TO THE BAG AT THE END OF THE SHIFT.
* TAKE GLOVES OUT OF TOOL-BAG.
* THIS OCCURS AT THE UNIT.
* PUT GLOVES BACK IN THE BAG
* AT THE END OF THE SHIFT.
WELDER BEGINS AT UNIT

1	PULL GLOVES WITH BEND AT TOOL-BAG F 2			
	A1 B6 G1 H1 XO IO AO	2.00	180.	
2	HOLD+TOSS GLOVES TO TOOLTRAY			
	A0 BO GO A1 BO PO AO	1.00	10.	
3	HOLD+PLACE GLOVES FROM WELDER TO TOOL-BAG			
	AO BO GO A1 BO P3 AO	i.00	40.	
		TOTAL TMU	230.	

747. START (PREPARE + STRIKE ARC) WELDMENT FOR (SEMIAUTOMATIC WELDING) WITH WELDING GUN AT ANY (WORK STATION) PANEL SHOP (PANEL LINE) WELDING
PER EACH OCCURANCE OFG: 1 23-JUL-82
THE WELDER IS ALL SET UP FOR WELDING AND IS WITHIN REACH OF WHERE THE ARC WILL BE STRUCK.
* WELDER REPOSITIONS BODY AFTER EACH WELD
WELDER BEGINS AT WJEB

1	MOVE PLIERS AND HOOD AND TOOLTRAY WITH BEND TO WEB F 1 / 50			
	A1O B6 G1 A1O BO P1 AO	0.02	6.	
2	PICKUP PLIERS F 1 /4			
	A1 BO Gi A1 BO PO AO	0.25	7.	
3	HOLD+LOOSEN SLAG IN NOZZLE AT WEB 2 TAPS USING FLIERS AND HOLD F 1 / 4			
	AO BO GO A1 BO PO L3 AO EO PO AO	0.25	10.	
4	HOLD+CUTOFF END-OF-WIRE AT WEB SOFT USING PLIERS AND RETURN TO WEB WITH BEND F 1 /4			
	AO BO GO Al BO P3 C3 A1 B6 P1 AO	0.25	37.	
5	HOLD+MOVE GUN FROM WELDER TO JOINT AT WEB AND HOLD (NEAR AREA WHERE ARC WILL BE STRUCK)			
	AO BO GO A1 BO P1 AO	1.00	20.	
6	INSPECT 1 POINT ON THE JOINT			
	AO BO GO AO BO PO T1 AO BO PO AO	2.00	10.	
7	HOVE THE VENT-TUBE FROM THE WEB TO THE WEB (REPOSITION A SHORT DISTANCE FOR THE NEXT WELD)			
	A1 BO G1 A1 BO P1 AO	1.00	40.	

8 MANEUVER SELF AT WEB (REPOSITION BODY)
A1 BO G1 M10 X0 I0 A0 1.00 120.
9 HOLD+PUSH SEMIAUTOMATIC TRIGGER FOR STARTING ARC
A0 B0 G0 M1 X0 I0 A0 1.00 10.

TOTAL TMU 261.

863. SET-UP WIRE FEEDER (SEMIAUTOMATIC) FOR (WELDING) AT ANY (WORK STATION - SEAM WELD) PANEL SHOP (PANEL LINE) WELD
PER EACH SET-UP OFG: 4 26-AUG-82
LEADS ARE ALL HOOKED UP.
* MOVE FEEDER ONTO UNIT AT START OF JOB,
* AND OFF AT THE END OF THE JOB.
* LEADS ARE HOOKED UP AND COILED ON OR
* NEAR THE RECTIFIER,
WELDER BEGINS AT UNIT

1 GET+MOVE WIRE FEEDER WITH CLIMB-STEP FROM WEST WALL NEAR UNIT TO UNIT WITH2 STEPS
Al B10 G3 A3 BO P1 AO 1.00 180.
2 MANEUVER SEMIAUTO-GUN AT UNIT (UNCOIL OFF WIRE FEEDER)
Al B0 G1 M10 X0 I0 A0 1.00 120.
3 PULL LEAD WITH BEND FROM RECTIFIER ALONG WEST WALL NEAR UNIT TO UNIT PF 5(4)
Al B6 G1 (Ml)X0 I0 A1 (5) 1.00 140.
4 PUSH SWITCH AT RECTIFIER (ALONG WEST WALL) NEAR UNIT (TURN ON RECTIFIER)
Al B0 G1 M1 X0 I0 A0 1.00 30.
5 TURN KNOB AT RECTIFIER NEAR UNIT (SET VOLTAGE)
Al B0 G1 M3 X0 I0 A0 1.00 50.
6 WALK TO UNIT 5 STEPS WITH CLIMB-STEP (GO-TO MANIFOLD)
A10 B10 G0 A0 B0 P0 A0 1.00 200.
7 LOOSEN GAS VLAVE AT MANIFOLD NEAR UNIT 5 SPINS USING FINGERS
Al B0 G1 Al B0 P1 L10 A0 B0 P0 A0 1.00 140.
8 WALK TO UNIT 5 STEPS WITH CLINB-STEP (BACK-TO WIRE FEEDER)
A10 B10 G0 A0 B0 P0 A0 1.00 200.
9 PICKUP SEMIAUTO-GUN FROM UNIT TO WELDER WITH KNEEL
Al B0 G1 Al B16 P0 A0 1.00 190.
10 PUSH SEMIAUTO-GUN ON-SWITCH AT UNIT
Al B0 G1 M1 X0 I0 A0 1.00 30.
11 HOLD+PUSH SEMIAUTO-GUN TRIGGER AT UNIT
A0 B0 G0 M1 X0 I0 A0 1.00 10.
12 WAIT 10 SEC FOR GAS LINE TO PURGE
1.00 278.
13 TURN AND ADJUST SEMIAUTO-GUN WIRE SPEED KNOB AT UNIT
Al B0 G1 M3 X0 I6 A0 1.00 110.

14 PUSH SEMIAUTO-GUN OFF SWITCH AT UNIT
Al B0 G1 U1 X0 I0 A0 1.00 30.
15 MANEUVER SEMIAUTO-GUN WITH BENI+STAND AT UNIT (COIL LEAD ONTO FEEDER)
Al B16 G1 M10 X0 I0 A0 1.00 280.
16 GET+MOVE WIRE FEEDER FROM UNIT TO UNIT WITH BEND AND 10 STEPS
A1 B0 G3 A16 B6 P1 A0 1.00 270.
17 MANEUVER LEAD AT RECTIFIER NEAR UNIT WITH CLIMG-STEP (COIL ONTO OR NEAR RECTIFIER)
Al B0 G1 M1O X0 I0 A0 1.00 120.
l8 PUSH SWITCH AT RECTIFIER NEAR UNIT (TURN OFF RECTIFIER)
Al B0 G1 M1 X0 I0 A0 1.OO 30.
19 FASTEN GAS VALVE WITH CLIMB-STEP AT RECTIFIER MANIFOLD NEAR UNIT 5 SPINS USING FINGERS
Al B10 G1 Al B0 P1 F10 A0 B0 P0 A0 1.OO 240.

TOTAL TMU 2648.

866. WELD PLATE (LARGE STARTING PAD) ON ASSEMBLY (PLATE BLANKET) WITH SEMIAUTOMATIC AT ANY (WORK STATION - SEAM WELD) PANEL SHOP (PANEL “NE) WELDING
PER EACH STARTING PAD OFG: 3 11-AUG-82
MOVE PADS TO UNIT IN A SEPARATE SUB-OP, THIS IS FOR LARGE PADS SUCH AS ARE USED ON TANKER UNITS,
* WELDER TAKES ONE PAD AT A
* TIME AND TACKS IT ON, AS
* SOON AS THE TACK IS MADE,
* THE WELDER WILL FINISH
* WELDING THE PAD,
WELDER BEGINS AT UNIT

1 GET+PLACE STARTING-PAD FROM UNIT TO WELDER WITH KNEEL
Al B10 G3 Al B16 P3 A0 1.00 240 l
2 PICKUP WELD-GUN FROM UNIT
A1 B0 G1 Al B0 P0 A0 1.OO 30.
3 CLOSE+PUSH TRIGGER ON WELD-GUN AT WELDER PT 5 S (MAKE TACK)
A0 B0 G1 M1 X16 I0 A0 1.00 180.
4 INSPECT 1 POINT USING EYES ON STARTING-PAD AT UNIT
A0 B0 G0 A0 B0 P0 T1 A0 B0 P0 A0 1.00 10.
5 CLOSE+PUSH TRIGGER ON WELD-GUN AT WELDER PT 65 S (FINISH WELD STARTING PAD)
A0 B0 GI M1 X173I0 A0 1.00 1750.

TOTAL TMU 221O.

869, SET-UP WELDING MACHINE (TANDEM-ARC) AT ANY (WORK STATION - SEAM WELD)
PANEL SHOP (PANEL LINE) WELDING
PER EACH SEAM OFG: 3 17-AUG-82
HOIST HAS BEEN UNHOOKED AND THE TANDEM-ARC IS BEING MANUALLY POSTIONED AT THE SEAM,
* THIS IS FOR THE LINDE LT-56 MACHINE,
* A TANDEM-ARC MACHINE,
WELDER BEGINS AT UNIT

1 PULL LOCK-HANDLE OF SUE-ARC AT UNIT SEAMWITH KNEEL	Al B16 G1 M X0 I0 A0	1.00	190.
2 PUSH TOGGLE AT UNIT SEAM TO-TURN THE MACHINE ON F 2	Al B0 G1 Ml X0 I0 A0	2.00	60.
3 PUSH BUTTON AT UNIT SEAM -- INCH WIRE DOWN PT 5 S	Al B0 G1 M1 X16 I0 A0	1.00	190.
4 CUTOFF AT UNIT HARD WIRE USING PLIERS AND ASIDE PLIERS PF 2 (1 2 3 4 5 6 7)	(A1 B0 G1 A1 B0 P3 C10)A1 B0 P1 A0 (2)	1.00	340.
5 MANEUVER SUB-ARC AT UNIT SEAM (LINE IT UP WITH THE GROOVE)	Al B0 G1 M10 X0 I0 A0	1.00	120.
6 TURN KNOB ON SUB-ARC AT UNIT F 5	Al B0 G1 M3 X0 I0 A0	5.00	250.
7 PUSH LOCK-HANDLE ON SUB-ARC AT UNIT (LOCK IN GEAR)	Al B0 G1 M1 X0 I0 A0	1.00	30.
a PULL CLIP ON SUB-ARC AT UNIT (RELEASE FLUX) F 2	Al B0 G1 M1 X0 I0 A0	2.00	60.
9 HOLD+MOVE CLIP FROM WELDER TO UNIT (SUB-ARC MACHINE) F 2	A0 B0 G0 A1 B0 P1 A0	2.00	40.
10 PUSH START BUTTON ON SUB-ARC AT UNIT F 2	Al B0 G1 M1 X0 I0 A0	2.00	60.
11 PICKUP CLIP FROM UNIT (SUB-ARC MACHINE TO) TO WELDER SIMO METHOD-STEPS 11-13 ARE INTERNAL TO-THE PROCESS TIME. F 2	<Al B0 G1 Al B0 P0 A0 >	2.00	0.
12 HOLD+PUSH CLIP ON SUB-ARC HOSE (STOP.FLUX) AT UNIT SIMO F 2	<A0 B0 G0 M1 X0 I0 A0 >	2.00	0.
13 PUSH STOP BUTTON ON SUB-ARC AT UNIT (STOP MACHINE) SIMO F 2	<Al B0 G1 Ml X0 I0 A0 >	2.00	0.

TOTAL TMU 1340.

870. MOVE WELDING MACHINE (SEMIAUTOMATIC) AT ANY (WORK STATION - SEAM WELD) PANEL SHOP (PANE
PER EACH SEAM OFG: 3 17-AUG-82
DRAG THE MACHINE BY THE WHIP END.
* SEAMS ARE ABOUT EIGHT FEET APART AND
* ABOUT FORTY FEET LONG, THEREFORE, AN
* AVERAGE DISTANCE FOR MOVING THE MACHINE
* MIGHT BE TWENTY FOUR FEET.
WELDER BEGINS AT UNIT

1 PICKUP WITH BEND WHIP FROM UNIT			
	A1 B6 G1 A1 B0 P0 A0	1.00	90.
2 HOLD+MANIPULATE WHIP AT UNIT			
	A0 H0 G0 M10 X0 I0 A0	1.00	100.
3 HOLD+MOVE WHIP FROM WELDER TO UNIT WITH BEND			
	A0 B0 G0 A1 B6 P1 A0	1.00	80.
		TOTAL TMU	270.

873. SET-UP AND TEAR DOWN CLAMP (GROUND-CLAMP) AT (SEAM WELD STATION) PANEL SHOP (PANEL LINE) WELDING
PER EACH OFG: 4 30-AUG-82
MUST BE CONNECTED PRIOR TO WELDING.
* GROUND-CLAMP LOCATED
* AT EACH END OF GANTRY.
* ONLY ONE NEED BE ATTACHED.
WELDER BEGINS AT UNIT

1 WALK FROM UNIT TO GANTRY WITH CLIMB-STEP			
	A16 B10 G0 A0 B0 P0 A0	1.00	260.
2WITHOUT STEPS MANIPULATE GROUND-CLAMP-CORD AT GANTRY WITH CLIMB-STEP			
	Al B10 G1 M10 X0 I0 A0	1.00	220.
3 HOLD+PLACE GROUND-CLAMP FROM WELDER TO GANTRY WITH BEND ,PLATE EDGE			
	A0 B0 G0 A1 B6 P3 A0	1.00	100.
4 HOLD+FASTEN GROUND-CLAMP WITH 5 WRIST-TURNS USING HAND			
A0 B0 G0 Al B0 P1 F10 A0 B0 P0 A0		1.00	120.
5 WALK FROM GANTRY TO UNIT WITH CLIMB-STEP			
	A16 B10 G0 A0 B0 P0 A0	1.00	260.
6 WALK FROM UNIT TO GANTRY W1TH CLIMB-STEP			
	A16 B10 G0 A0 B0 P0 A0	1.00	260.
7 LOOSEN GROUND-CLAMP WITH 5 WRIST-TURNS USING HAND			
Al B0 G1 Al B0 P1 L10 A0 B0 P0 A0		1.00	140.
8 MANIPULATE GROUND-CLAMP AT GANTRY WITH CLIMB-STEP FOR COILING CORD SIMO (1 3)			
	<A1>B10 <G1>M10 X0 I0 A0	1.00	200.
9 HOLD+PLACE GROUND-CLAMP FROM WELDER TO GANTRY			

A0 B0 G0 Al B0 P3 A0 1.00 40.

TOTAL TMU 1600.

874. TEAR DOWN WELDING MACHINE (SUB-ARC) AT ANY (WORK STATION - SEAM WELD)
PANEL SHOP (PAN
PER EACH ASSEMBLY OFG: 4 12-AUG-82
SUB-ARC WELDING HAS BEEN COMPLETED.
* SUB-ARC IS STORED AT THE WEST SIDE
* OF THE PANEL LINE.
WELDER BEGINS AT UNIT

1 PUSH BUTTON AT HOIST PT 14 S
A16 B0 G1 Ml X42 I0 A0 1.00 600.
2 PUSH BUTTON AT HOIST 7 S
Al B0 G1 M1 X0 I0 A0 1.00 30.
3 MANIPULATE HOOK AT SUB-ARC UNIT WITHOUT STEPS
Al B0 G1 M10 X0 I0 A0 1.00 120.
4 PUSH BUTTON AT HOIST PT 7 S
A16 B0 G1 M1 X16 I0 A0 1.00 340.
5 PUSH BUTTON AT HOIST PT 14 S
Al B0 G1 H1 X42 I0 A0 1.00 450.
6 PUSH GANTRY-LADDER AT GANTRY WITH 4 STEPS
A6 B0 G1 M1 X0 I0 A0 1.00 80.
7 HOLD+SLIDE GANTRY-LADDER AT GANTRY
A0 B0 G0 H3 X0 I0 A0 1.00 30.
8 PUSH RUNGS AT GANTRY F 28
Al B0 G1 M1 X0 I0 A0 28.00 840.
9 PUSH LADDER RUNGS AT GANTRY SIMO (1) (3 4 5) PF 2 (2)
<A1>(B16)<G1M1 X0 >I0 A0 (2) 1.00 320.
10 WITH 4 STEPS PUSH BUTTON AT GANTRY WITH PBEND AND RETURN TO GANTRY
WITH 4 STEPS PF S (234)
A6 (B3 G1 Ml)X0 I0 A6 (5) 1.00 370 l
11 MANIPULATE GANTRY-LADDER AT GANTRY TO-PUT IT AWAY
Al B0 G1 M10 X0 I0 A0 1.00 120.
12 WALK FROM GANTRY TO GANTRY WITH 16 STEPS AND WITH CLIMB-STEP
A32 B10 G0 A0 B0 P0 A0 1.00 420.
13 PUSH BUTTON AT GANTRY F 3
Al B0 G1 M1 X0 I0 A0 3.00 90.

TOTAL TMU 3810.

875. MOUE GANTRY CRANE FOR SUB-ARC AT ANY (WORK STATION - SEAM WELD) PANEL SHOP (PANEL LINE) WELDING
PER EACH MOVE OFG: 4 12-AUG-82
COVERS MOVING JUST THE GANTRY (WITH ANY ATTACHED LOAD) ABOUT EIGHT FEET.
* WALK FROM THE UNIT TO THE GANTRYT,MOVE
* THE GANTRY AND RETURN TO THE UNIT.
WELDER BEGINS AT UNIT

1 WALK TO GANTRY WITH CLIMB-STEP	A16 B10 G0 A0 B0 F0 A0	1.00	260.
2 PUSH START BUTTON AT GANTRY	A1 B0 G1 M1 X0 I0 A0	1.00	30.
3 PULL HANDLE PT 8.32 S	Al B0 G1 *MI* X24 I0 A0	1.00	270.
4 PUSH OFF BUTTON AT GANTRY	Al B0 G1 Ml X0 I0 A0	1.00	30.
5 WALK TO WEB WITH CLIMB STEP	A3 B16 GO A0 B0 F0 A0	1.00	190.
		TOTAL TMU	780.

876. CLEAN WELDMENT ON (STARTING PAD) WITH BRUSH (AND PICK) AT ANY (WORK STATION - SEAM WELD) PANEL SHOP (PANEL LINE) WELDING
PER EACH PAD OFG: 3 12-AUG-82
AVERAGE ABOUT THREE TRIPS PER PAD.
* ESTIMATE THAT THERE MILL USUALLY BE
* AN AVERAGE OF EIGHT STARTING FADS PER
* PLATE BLANKET.
WELDER BEGINS AT UNIT

1 HOVE WIREBRUSH AND PICK TO UNIT SEAM PF (3 4 5 6) F 1 / 8	Al B0 (Gl Al B0 P1)A0 (1) 0.12		5.
2 HOLD+MOVE WELD-GUN FROM WELDER TO UNIT	A0 B0 G0 A1 B0 P1 A0	1.00	20.
3 LOOSEN THE SLAG ON THE STARTING FAD AT THE UNIT SEAM WITH 6 STRIKES USING THE PICK ANDRETURN F 3	Al B0 G1 Al B0 P0 L16 Al B0 P1 A0	3.00	630.
4 BRUSHCLEAN THE STARTING PAD AT THE UNIT SEAM .5 SQ.FT. USING THE WIREBRUSH AND RETURN F 3	Al B0 G1 Al B0 P1 S6 Al B0 P1 A0	3.00	360.
5 INSPECT 1 POINT F 3	A0 B0 G0 A0 B0 P0 T1 A0 B0 P0 A0	3.00	30.
		TOTAL TMU	1045.

877. SET-UP WELDING MACHINE FOR SUB-ARC (WELDING) AT ANY (WORK STATION - SEAM WELD) PANEL SHOP(FANEL LINE) WELDING
PER EACH ASSEMBLY OFG: 4 31-AUG-82
EVERYTHING SHOULD BE SHUT DOWN WHEN JOB IS FINISHED.
* THE SUB-ARC IS LEFT AT THE HIGHEST POINT
* AT THE GANTRY AFTER THE WELDING IS
* COMPLETED+ THE WELDER MUST CLIMB UP
* ONTO THE GANTRY PLATFORM TO TURN ON THE
* POWER FOR THE SUB-ARC, THE POWER SHOULD
* BE SHUT OFF AFTER THE WELDING IS
* COMPLETED,
WELDER BEGINS AT UNIT

1	PUSH GANTRY-LADDER AT GANTRY A16 B0 G1 Ml X0 I0 A0	1.00	180.
2	HOLD+SLIDE GANTRY-LADDER AT GANTRY A0 B0 G0 M3 X0 I0 A0	1.00	30.
3	PUSH RUNGS AT GANTRY F 28 Al B0 G2 M1 X0 10 A0	28.00	840.
4	PUSH LADDER RUNGS AT GANTRY SIMO (1)(3 4 5)P F 2 (2) <A1>(B16)<G1M1 X0>I0 A0 (2) 1.00		320.
5	WITH 4 STEPS PUSH BUTTON AT GANTRY WITH PBEND AND RETURN TO GANTRY WITH 4 STEPS PF5 (2 3 4) A6 (B3 G1 M1)X0 I0 A6 (5) 1.00		370.
6	MANIPULATE GANTRY-LADDER AT GANTRY TO-PUT IT AWAY Al B0 G1 M10 X0 I0 A0	1.00	120.
7	WITH 4 STEPS PUSH BUTTON AT HOIST PT 15 S A6 B0 G1 M1 X42 I0 A0	1.00	500.
8	WITH CLOSE+OPEN PUSH BUTTON AT GANTRY F 3 (TURN ON GANTRY) A0 B0 G1 M3 X0 I0 A0	3.00	120.
9	PULL HANDLE AT GANTRY PT 20 S A1 80 G2 MI X54 15 A0	1.00	570.
10	WITH CLOSE+OPEN PUSH BUTTON AT HOIST PT 7 S A0 B0 G1 M3 X16 I0 A0	1.00	200.
11	PULL SUB-ARC AT UNIT SEAM WITHOUT STEPS Al B0 G1 M1 X0 I0 A0	1.00	30.
12	PUSH BUTTON AT HOIST PT 1 S WITHOUT STEPS Al B0 G1 M1 X3 I0 A0	1.00	60.
13	MANIPULATE HOOK AT UNIT WITHOUT STEPS (UNHOOK SUB-ARC) Al B0 G1 M10 X0 I0 A0	1.00	120.

TOTAL TMU 3460.

878. MAKE READY OPERATOR FOR SUB-ARC AT ANY (WORK STATION - SEAM WELD) PANEL SHOP (PANEL LINE) WELDING
PER EACH ASSEMBLY OFG: 4 13-AUG-82
MEET LEAD PERSON NEAR TOOLBOX FIRST
* GET VERBAL INSTRUCTIONS FROM LEAD PERSON
* GET HARD HAT AND TOOL
* BAG FROM TOOLBOX, WALK OVER TO THE UNIT
* IN THE SEAH-WELD STATION.
WELDER BEGINS AT TOOLBOX

1 READ 54 WORDS (RECEIVE INSTRUCTIONS FROM SUPERVISOR) A0 B0 G0 A0 B0 P0 T24 A0 B0 P0 A0	1.00	240.
2 MOVE WITH BEND HARDHAT FROM TOOLBOX TO WELDER 'S HEAD Al B6 GI Al B0 P1 A0	1.00	100.
3 GET+MOVE TOOLBAG WITH BEND FROM TOOLBOX TO SEAM-WELD WITH BEND+CLIMB-STEP Al B6 G3 A113B16 P1 A0	1.00	1400.
TOTAL TMU		1740.

884. MOVE PLATE (LARGE STARTING PAD) ON ASSEMBLY (PLATE BLANKET) AT ANY (WORK STATION - SEAM WELD) PANEL SHOP (PANEL LINE) WELDING
PER EACH LARGE STARTING PAD. OFG: 3 02-SEP-82
MOVE EACH PAD TO THE UNIT AND SET IT DOWN AT THE END OF THE SEAM.
* PADS SHOULD BE STORED
* ALONG THE SIDE OF THE SEAM WELD STATION.
* ONLY TAKE ONE AT A TIME BECAUSE
* THEY ARE HEAVY.
WELDER BEGINS AT SEAM-WELD

1 WALK TO SEAM-WELD STATION PILE OF STARTING PADS 10 STEPS WITH CLIMB-STEP A16 B10 G0 A0 B0 P0 A0	1.00	260.
2 GET+MOVE START-PAD WITH BEND FROM SEAM-WELD STATION PILE OF STARTING FADS TO WELDER Al B6 G3 Al B0 P1 A0	1.00	120.
3 MOVE START-PAD FROM WELDER TO SEAM-WELD 10 STEPS AND WITH CLIMB-STEP Al B0 G1 A16 M0 P1 A0	1.00	290.
TOTAL TMU		670.

886, CLEAN SEAM ON ASSEMBLY WITH BROOM AT ANY PANEL SHOP (PANEL LINE) WELDING
PER EACH SEAM OFG: 3 02-SEP-82
SWEEP OFF DIRT PRIOR TO WELDING

* THAT THE TYPICAL SEAM LENGTH WILL BE
* ABOUT 30 FEET,
* THE OPERATOR WILL BE ABLE TO SWEEP THE
* SEAM IN THREE FOOT INCREMENTS.
* THEREFORE A FREQUENCY OF 10 IS USED TO
* COVER THE ENTIRE SEAM.
WELDER BEGINS AT UNIT

1 MOVE BROOM FROM WEST WALL NEAR UNIT TO UNIT WITH 10 STEPS F 1 / 4			
	Al BO G1 A16 B0 P1 AO	0.25	48.
2 BRUSHCLEAN UNIT SEAM 3 SQ,FT. USING THE BROOM AND HOLD F 10			
	Al BO G1 Al BO PI S24 AO BO PO AO	10.00	2800.
3 MOVE BROOM FROM WELDER TO UNIT			
	Al BO GI Al BO PI AO	1.00	40.
		TOTAL TMU	2888.

887. CLEAN WELDMENT ON (SEAM) WITH HAMMER (PICK) AT ANY PANEL SHOP (PANEL LINE) WELDING
PER EACH FOOT OFG: 2 02-SEP-82
CLEAN WELDMENT AFTER SUB-ARC / TANDEM-ARC WELDING
* ESTIMATE THAT 75% OF THE SLAG WOULD BE
* CLEANED WHILE THE MACHINE WAS STILL
* WELDING. THE REMAINING 25% WOULD BE
* CLEANED AFTER THE MACHINE HAS STOPPED,
WELDER BEGINS AT UNIT

1 LOOSEN THE SLAG ON THE SEAM AT THE UNIT WITH 6 STRIKES USING THE PICK AND RETURN			
	Al BO G1 Al BO PO L16 Al BO P1 AO	1.00	2100
2 INSPECT 1 POINT			
	AO BO GO AO BO PO T1 AO BO PO AO	1.00	10.
		TOTAL TMU	220 .

893, WELD BUTT ON ASSEMBLY WITH SUB-ARC AT ANY PANEL SHOP (PANEL LINE) W
ELDING
PER 1 FOOT OFG: 2
.BUTT-l/l6X1/2...PL... LT7-1NA-5/16

1 FIRST SIDE 5/16′ PLATE, LINCOLN LT7

TOTAL TMU 958.

894, WELD BUTT (ON ASSEMBLY WITH SUB-ARC AT ANY PANEL SHOP (PANEL LINE) W
ELDING
PER 1 FOOT OFG: 2
BUTT-1/16X5/8...PL...LT7-2NA-5/16

1 SECOND SIDE 5/14$ PLATE, LINCOLN LT7

TOTAL TMU 1101.

896, WELD BUTT ON ASSEMBLY WITH TANDEM-ARC AT ANY PANEL SHOP (PANEL LINE)
WELDING
PER 1 FOOT OFG: 2
BUTT-1/16X5/8...PL...LT56-1NA-5/8

1 FIRST SIDE 1/2′<->5/8′ PLATE, TANDEM-ARC

TOTAL TMU 675.

897, WELD SEAM ON ASSEMBLY WITH TANDEM-ARC AT ANY PANEL SHOP (PANEL LINE)
WELDING
PER 1 FOOT OFG: 2
B2V,2-AI-5/8...PL....LT56-2GA-5/8

1 SECOND SIDE 3/8′<->″5/8′ PLATE, TANDEM-ARC

TOTAL TMU 809.7

902, WELD SEAM ON ASSEMBLY WITH TANDEM-ARC AT ANY PANEL SHOP (PANEL LINE) WELDING
PER 1 FOOT DFG: 2
B2V.2-AI-1/2...FL...LT56-1GA-1

1 FIRST SIDE 1′ PLATE, TANDEM-ARC

TOTAL TMU 1445.3

903, WELD SEAM ON ASSEMBLY WITH TANDEM-ARC AT ANY PANEL SHOP (PANEL LINE) WELDING
PER 1 FOOT OFG: 2
B2V,3-AI-l/2...PL...LT56-2GA-l

1 SECOND SIDE 1′ PLATE, TANDEM-ARC

TOTAL TMU 1346.6

992. WELD PT1S.l-AI-l/4 ON ASSEMBLY WITH SEMIAUTOMATIC AT FLAT (WEB STATION) PANEL SHOP (PANEL LINE) WELDING
PER 1 FOOT OFG: 2
PTlS.l-AI-1/4...PL...E71T-1-A-FIN---3

1 1/4′ FLAT FILLET.

TOTAL TMU 3331 .

993. WELD PT1S.l-AI-5/16 ON ASSEMBLY WITH SEMIAUTOMATIC AT FLAT (WEB S TATION) PANEL SHOP (PANEL LINE) WELDING
PER 1 FOOT OFG: 2
PTIPTls.l-AI-5/16...PL...E71T-1-A-FIN---3

1 5/16′ FLAT FILLET.

TOTAL TMU 5006.

994. WELD PT1S,1-AI-3/8 ON ASSEMBLY WITH SEMIAUTOMATIC AT FLAT (WEB STATION)
PANEL SHOP (PANEL LINE) WELDING
PER 1 FOOT OFG: 2
PT1S,1-AI-3/8...PL...E71T-1-A-FIN---3

1 3/8′ FLAT FILLET.

TOTAL TMU 6883.

998. WELD PT1S,1-AI-1/4 ON ASSEMBLY WITH SEMIAUTOMATIC AT VERTICAL (WEB S
TATION) PANEL SHOP (PANEL LINE) WELDING
PER 1 FOOT OFG: 2
PT1S.1-AI-1/4...PL...E71T-1-A-VIN---4

1 1/4′ VERTICAL FILLET,

TOTAL TMU 3273.

999. WELD PT1S.1-AI-5/16 ON ASSEMBLY WITH SEMIAUTOMATIC AT VERTICAL (WEB
STATION) PANEL SHOP (PANEL LINE) WELDING
PER 1 FOOT OFG: 2
PT1S.1-AI-5/16...PL...E71T-1-A-VIN---5

1 5/16′ VERTICAL FILLET,

TOTAL TMU 4405.

1000. WELD PT1S.1-AI-3/8 ON ASSEMBLY WITH SEMIAUTOMATIC AT VERTICAL (WEB S
TATION) PANEL SHOP (PANEL LINE) WELDING
PER 1 FOOT OFG: 2
PT1S,1-AI-3/8.,,PL...E71T-1-A-VIN---5

1 3/8′ VERTICAL FILLET.

TOTAL TMU 6820.

441. COMBINED SUB-OP

WELD GOUGE (SECOND SIDE) ON ASSEMBLY WITH SEMIAUTOMATIC AT VERTICAL
UNIT ASSEMBLY SHOP WELDING
SECOND SIDE OF GROOVE JOINT,GOUGED VERTICAL, (5/16′ FLATE OR LESS)
FER 1 FOOT OFG: 3 20-JAN-82
* GOUGE SECOND SIDE
* WELD AFTER GOUGE

TOTAL TMU 20104.8

Combined sub-operation elements		FreQ.	TMU
378. WELD GOUGE ON ASSEMBLY WITH SEMIAUTOUATIC AT VERTICAL UNIT ASSEMBLY SHOP WELDING		0.01	15262.7
382. GOUGE BUTT ON ASSEMBLY WITH CARBON ELECTRODE AT ANY UNIT ASSEMBLY SHOP WELDING		0.01	4842.1
Total TMU			20104.8

497 . COMBINED SUB-OP

WELD TIE BUTT ON ASSEMBLY WITH STICK ELECTRODE AT (COMPLETE) UNIT ASSEMBLY SHOP WELDING
9'X7 1/2'X25# TEE BAR
PER EACH OFG: 3 20-JAN-82
* WELD FIRST SIDE
* GOUGE AND WELD SECOND SIDE

TOTAL TMU 63921.1

Combined sub-operation elements	Freq.	TMU
432. WELD B2V,1AP ON ASSEMBLY WITH SEMIAUTOMATIC AT VERTICAL UNIT ASSEMBLY SHOP WELDING	0.01	9515.0
439. WELD B2V.1AP ON ASSEMBLY WITH STICK ELECTRODE AT VERTICAL UNIT ASSEMBLY SHOP WELDING	0.01	16199.3
186. CLEAN WELD JOINT ON ASSEMBLY WITH PICK AND WIRE-BRUSH AT ANY SHOP AREA WELDING	5.00	2500.0
174. PREPARE % STRIKE ARC FOR MANUAL (STICK) WELDING AT ANY SHIP OR SHOP AREA WELDING	5.00	600.0
382. GOUGE BUTT ON ASSEMBLY WITH CARBON ELECTRODE AT ANY UNIT ASSEMBLY SHOP WELDING	0.01	6779.0
178. PREPARE+STRIKE ARC FOR ARC GOUGING WITH CARBON AT ANY SHOP WELDING AREA	3.00	5880.0
429 . REPOSITION OBJECT ON ASSEMBLY AT UNIT ASSEMBLY SHOP WELDING	3.00	1080.0
366. WELD GOUGE ON ASSEMBLY WITH SEMIAUTOMATIC AT VERTICAL UNIT ASSEMBLY SHOP WELDING	0.01	21367. 8
Total TMU		63921.1

917. COMBINED SUB-OP

SET-UP AND TEAR DOWN (GEAR) FOR (WELDING PADS) WITH SEMIAUTOMATIC
AT ANY (WORK STATION -SEAM WELD) PANEL SHOP (PANEL LINE) WELDING
USE FOR ANY PANEL BUILT AT THE PANEL LINE,
PER EACH PANEL OFG: 4 03-SEP-82
* GET SEMIAUTOMATIC SET-UP,
* ALSO COVERS USING GLOVES AND HOOD,
* COVERS PUTTING SEMIAUTOMATIC AWAY,

TOTAL TMU 3548.0

Combined sub-operation elements	Freq.	TMU
863. SET-UP WIRE FEEDER (SEMIAUTOMATIC) FOR (WELDING) AT ANY (WORK STATION - SEAM WELD) PANEL SHOP (PANEL LINE) WELD	1.00	2648.0
746. ARRANGE GLOVES (MITTENS) ON ASSEMBELY (AT TOOL-BAG) AT ANY (WORK STATION) PANEL SHOP (PANEL LINE) WELDING	1.00	230.0
608. ARRANGE GLOVES (MITTENS) ON ASSEMBLY AT ANY (WORK AREA) PANEL SHOP (PANEL LINE) WELDING	1.00	280.0
595. COMBINE HELMET (HOOD AND HARDHAT) AT ANY (WORK STATION) PANEL SHOP (PANEL LINE) WELDING	1.00	390.0
Total TMU		3548.0

920. COMBINED SUB-OP

WELD PLATE (STARTING PADS) ON ASSEMBLY (PANEL) WITH SEMIAUTOMATIC
AT ANY (WORK STATION - SEAM WELD) PANEL SHOP (PANEL LINE) WELDING
CAN BE USED FOR ANY PANEL
PER EACH COMPLETE PANEL OFG: 4 07-SEP-82
* SINCE THE OVERALL TIME FOR PUTTING ON
* LARGE PADS IS VERY CLOSE TO THE SAME
* TIME REQUIRED FOR SMALL PADS ON A PER
* PANEL BASIS. THE SUB-OPS FOR THE LARGE
* PADS ARE USED HERE AND ARE FREQUENCIED
* TO COVER THE COMPLETE PANEL.

TOTAL TMU 25170.0

Combined sub-operation elements	Freq.	TMU
384. MOVE PLATE (LARGE STARTING PAD) ON ASSEMBLY (PLATE BLANKET} AT ANY (WORK STATION- SEAM WELD) PANEL SHOP (PANEL LINE) WELDING	6.00	4020.0
866. WELD PLATE (LARGE STARTING PAD) ON ASSEMBLY (PLATE BLANKET) W1TH SEMIAUTOMATIC AT ANY (WORK STATION - SEAM WELD) PANEL SHOP (PANEL NE) WELDING	6.00	13260.0
870. MOVE WELDING MACHINE (SEMIAUTOMATIC) AT ANY (WORK STATION - SEAM WELD) PANEL SHOP (PANE	.6.00	1620.0
876. CLEAN WELDMENT ON (STARTING PAD) WITH BRUSH (AND PICK) AT ANY (WORK STATION - SEAM WELD) PANEL SHOP (PANEL LINE) WELDING	6.00	6270.0
Total TMU		25170.0

921. COMBINED SUB-OP

SET-UP AND TEAR DOWN WELDING MACHINE (ET. ALL) FOR SUB-ARC (OR TANDEM-ARC) AT ANY (WORK STATION - SEAM WELDING) PANEL SHOP (PANEL LINE) WELDING
CAN BE USED FOR ANY PANEL
PER EACH COMPLETE PANEL OFG: 4 07-SEP-82
* ALL FREQUENCIES IN THIS COMBINED SUB-OP
* ARE DOUBLED INORDER TO COVER BOTH SIDES
* OF THE PANEL WITH THIS ONE COMBINED
* SUB-OP. THIS COMBINED SUB-OP COVERS
* MOVING THE GANTRY TO THE SEAM, UNHOOKING
* THE MACHINE, HOOKING THE MACHINE BACK
* UP.

TOTAL TMU 21220.0

Combined sub-operation elements	Freq.	TMU
873. SET-UP AND TEAR DOWN CLAMP (GROUND-CLAMP) AT (SEAM WELD STATION) PANEL SHOP (PANEL LINE) WELDING	2.00	3200.0
877. SET-UP WELDING MACHINE FOR SUB-ARC (WELDING) AT ANY (WORK STATION - SEAM WELD) PANEL SHOP (PANEL LINE) WELDING	2.00	6920.0
874. TEAR DOWN WELDING MACHINE (SUB-ARC) AT ANY (WORK STATION - SEAM WELD) PANEL SHOP (PAN	2.00	7620.0
878. MAKE READY OPERATOR FOR SUB-ARC AT ANY (WORK STATION - SEAM WELD) PANEL SHOP (PANEL LINE) WELDING	2.00	3480.0
Total TMU		21220.0

1013. COMBINED SUB-OP

WELD COLLAR ON ASSEMBLY WITH SEMIAUTOMATIC AT (WEB STATION) PANEL SHOP (PANEL LINE) WELDING
FOR TIGHT COLLARS WITH LARGEST DIMENSION =>6′ AND <=12′.
*
CLEAN PRIOR TO WELDING
* CHANGE POSITION FOR PREPARE AND STRIKE
* 4 TIMES PER SIDE OF COLLAR.
* REPOSITION LEAD, VENT TUBE, ETC. WITH A
* CRAWLING MOTION AND KNEELING/ARISING.

TOTAL TMU 19820.0

Combined sub-operation elements	Freq.	TMU
590 . CLEAN WELDMENT ON ASSEMBLY WITH BRUSH (AND PICK) AT ANY (WORK AREA) PANEL SHOP (PANEL LINE) WELDING	8.00	3800.0
747. START′ (PREPARE + STRIKE ARC) WELDMENT FOR (SEMIAUTOMATIC WELDING) WITH WELDING GUN AT ANY (WORK STATION) PANEL SHOP (PANEL LINE) WELDING	8.00	2088.0
998. WELD PTIS.l-AI-l/4 ON ASSEMBLY WITH SEMIAUTOMATIC AT VERTICAL (WEB STATION) PANEL SHOP (PANEL LINE) WELDING	4.00	13092 .0
425. REPOSITION OBJECT ON ASSEMBLY AT UNIT ASSEMBLY SHOP WELDING	3.OO	840.0
Total TMU		19820 . 0

1015+ COMBINED SUB-OP

WELD COLLAR ON ASSEMBLY WITH SEMIAUTOMATIC AT (WEB STATION) PANEL SHOP (PANEL LINE) WELDING
FOR NON-TIGHT COLLARS WITH LARGEST DIMENSION =>6′ AND <=12′+
PER EACH COLLAR OFG: 3 21-SEP-82
* CLEAN PRIOR TO WELDING,
* CHANGE POSITION FOR PREPARE AND STRIKE
* 4 TIMES PER SIDE OF THE COLLAR,
* REPOSITION LEAD, VENT TUBE, ETC. WITH A
* CRAWLING MOTION AN KNEELING/ARISING,

TOTAL TMU 19820,0

	Combined sub-operation elements	Freq.	TMU
590 *	CLEAN WELDMENT ON ASSEMBLY WITH BRUSH (AND PICK) AT ANY (WORK AREA) PANEL SHOP (PANEL LINE) WELDING	8,00	3800+0
747,	START (PREPARE +STRIKE ARC) WELDMENT FOR (SEMIAUTOMATIC WELDING) WITH WELDING GUN AT ANY (WORK STATION) PANEL SHOP (PANEL LINE) WELDING	8+00	2088+0
998,	WELD PTIS,l-AI-l/4 ON ASSEMBLY WITH SEMIAUTOMATIC AT VERTICAL (WEB STATION) PANEL SHOP (PANEL LINE) WELDING	4,00	13092,0
425,	REPOSITION OBJECT ON ASSEMBLY AT UNIT ASSEMBLY SHOP WELDING	3,00	840,0
	Total TMU		19820+0

1022. COMBINED SUB-OP

WELD COLLAR ON ASSEMBLY WITH SEMIAUTOMATIC AT (TIGHT) (PANEL LINE) WELDING PANEL SHOP
FOR TIGHT COLLARS WITH LARGEST DIMENSION OF ABOUT 18′
PER 1 EACH OFG: 3 22-SEP-82
* CLEAN PRIOR TO WELDING.
* TIME IS ALLOWED FOR MOVING FROM ONE
* COLLAR TO THE NEXT. WELD ALL COLLARS
* ON ONE SIDE AND THEN MOVE TO THE OTHER
* SIDE OF THE WEB.

TOTAL TMU 66896.0

Combined sub-operation elements	Freq.	TMU
590. CLEAN WELDMENT ON ASSEMBLY WITH BRUSH (AND PICK) AT ANY (WORK AREA) PANEL SHOP (PANEL LINE) WELDING	16.00	7600.0
747. START (PREPARE + STRIKE ARC) WELDMENT FOR (SEMIAUTOMATIC WELDING} WITH WELDING GUN AT ANY (WORK STATION) PANEL SHOP {PANEL LINE) WELDING	16.00	4176.0
1000. WELD PT19.l-AI-3/8 0N ASSEMBLY WITH SEMIAUTOMATIC AT VERTICAL (WEB STATION) PANEL SHOP (PANEL LINE) WELDING	8.00	54560.0
425. REPOSITION OBJECT ON ASSEMBLY AT UNIT ASSEMBLY SHOP WELDING	2.00	560.0
Total TMU		66896.0

1023. COMBINED SUB-OP

WELD COLLAR ON ASSEMBLY WITH SEMIAUTOMATIC AT (NON-TIGHT} PANEL SHOP (PANEL LINE} WELDING
FOR NON-TIGHT COLLARS WITH LARGEST DIMENSION OF ABOUT 18′
PER EACH COLLAR OFG: 3 22-SEP-82
* CLEAN PRIOR TO WELDING.
* ALL COLLARS ARE TO BE WELDED ALONG ONE
* SIDE OF THE WEB. THEN MOVE TO THE
* OTHER SIDE OF THE WEB TO WELD THE
* SECOND SIDE. TIME IS ALLOWED FOR
$. MOVING FROM ONE COLLAR TO THE NEXT .

TOTAL TMU 47576.0

Combined sub-operation elements	Freq.	TMU
590. CLEAN WELDMENT ON ASSEMBLY WITH BRUSH (AND PICK) AT ANY (WORK AREA) PANEL SHOP (PANEL LINE) WELDING	16.00	7600.0
747. START (PREPARE + STRIKE ARC) WELDMENT FOR (SEMIAUTOMATIC WELDING) WITH WELDING GUN AT ANY (WORK STATION) PANEL SHOP (PANEL LINE) WELDING	16.00	4174.0
999. WELD FT1S.1-AI-5/16 ON ASSEMBLY WITH SEMIAUTOMATIC AT VERTICAL (WEB STATION) PANEL SHOP (PANEL LINE) WELDING	8.00	35240.0
425. REPOSITION OBJECT ON ASSEMBLY AT UNIT ASSEMBLY SHOP WELDING	2.00	560.0
Total TMU		47576.0

906. COMBINED SUB-OP

WELD (COMPLETE) SEAM (5/16′ PLATE) ON ASSEMBLY (PANEL) WITH SUB-ARC AT ANY (WORK STATION - SEAM WELD) PANEL SHOP (PANEL LINE) WELDING
THE COMPLETE WELD, USING A LINCOLN LT7
PER FOOT 0FG: 2 03-SEP-82
* WELD THE FIRST SIDE AND CLEAN 25% OF
* THE SLAG, AFTER THE PANEL IS TURNED
* OVER, WELD THE SECOND SIDE AND CLEAN
* 25% OF THE SLAG, THE REST OF THE SLAG
* SHOULD HAVE BEEN CLEANED WHILE THE
* MACHINE WAS RUNNING.

TOTAL TMU 2169.0

Combined sub-operation elements	Freq.	TMU
887. CLEAN WELDMENT ON (SEAM) WITH HAMMER (PICK) AT ANY PANEL SHOP (PANEL LINE) WELDING	0.50	110.0
893. WELD BUTT ON ASSEMBLY WITH SUB-ARC AT ANY PANEL SHOP (PANEL LINE) WELDING	1.00	958.0
894. WELD BUTT ON ASSEMBLY WITH SUB-ARC AT ANY PANEL SHOP (PANEL LINE) WELDING	1.00	1101.0
Total TMU		2169.0

928. WELD (15 FEET OF BAR) FT1S.1-AI-3/16 ON ASSEMBLY (PANEL) WITH DOODLEBUG AT ANY (STIFFENER STATION) PANEL SHOP (PANEL LINE) WELDING
PER 15 FEET OF BAR (30 FEET OF WELD) OFG: 3
FT1S.1-AI-3/16...PL...DB-A-3/16FF

1 3/16′ FLAT FILLET USING .045′ SOLID WIRE.

TOTAL TMU 16963.

931. WELD (25 FEET OF BAR) PT16,l-AI-3/16 0N ASSEMBLY (PANEL) WITH DOODLEBUG AT ANY (STIFFENER STATION) PANEL SHOP (PANEL LINE) WELDING
PER 25 FEET OF BAR (50 FEET OF WELD) OFG: 3
PT1S.l-A1-3/16...PL...DB-A-3/16FF

1 3/16 FLAT FILLET USING .045″ SOL1D WIRE.

TOTAL TMU 25215.

1035. COMBINED SUB-OP

WELD WEB FRAME ON ASSEMBLY WITH SEMIAUTOMATIC AT (FFG TRANSVERSE) PANEL SHOP (PANEL LINE) WELDING
FOR 12′ WEB 40 FT LONG WITH 27 STIFFS ON 18′ SPACING. WELD IS;FLAT=65F T; TIE BUTT=1(3.5FT); STIFF.FACEPLATES=54(18FT); COLLARS=27T AND 27NT(90FT); SMALL BRKS=14(18FT).
PER EACH FFG TRANSVERSE WEB OFG: 4 23-SEP-82
* USE 7018 STICK WIRE TO WELD THE TIE BUTT
* AND SINCE THE TIMES ARE COMPARABLE USE
* #497 FOR THE 'TIE BUTT RATHER THAN WRITE
* A-NEW SUB-OP.
* USE 1/4′ FILLETS FOR ALL THE OTHER
* WELDS. USE A VERTICAL METHOD FOR THE
* STIFFENER FACEPLATES BECAUSE THEY WILL
* PROBABLY BE DONE WHEN THE COLLARS ARE.

TOTAL TMU 1547649.1

Combined sub-operation elements		Freq.	TMU
992. WELD PT1S.l-AI-l/4 ON ASSEMBLY WITH SEMIAUTOMATIC AT FLAT (WEB STATION) PANEL SHOP (PANEL LINE) WELDING		65.00	216515.0
497. COMBINED SUB-OP			
WELD TIE BUTT ON ASSEMBLY WITH STICK ELECTRODE AT (COMPLETE) ASSEMBLY SHOP WELDING	UNIT	1.00	63921.1
1015. COMBINED SUB-OP			
WELD COLLAR ON ASSEMBLY WITH SEMIAUTOMATIC AT (WEB STATION) SHOP (PANEL LINE) WELDING	PANEL		

27.00 535140.0

1013. COMBINED SUB-OP

WELD COLLAR ON ASSEMBELY WITH SEMIAUTOMATIC AT (WEB STATION) PANEL SHOP (PANEL LINE) WELDING

27.00 535140.0

998. WELD PTIS.l-AI-l/4 ON ASSEMBLY WITH SEMIAUTOMATIC AT VERTICAL (WEB STATION) PANEL SHOP (PANEL LINE) WELDING

26.00 85098.0

590 . CLEAN WELDMENT ON ASSEMBLY WITH BRUSH (AND PICK) AT ANY (WORK AREA) PANEL SHOP (PANEL LINE) WELDING

175.00 83125.0

747. START (PREPARE + STRIKE ARC) WELDMENT FOR (SEMIAUTOMATIC WELDING) WITH WELDING GUN AT ANY (WORK STATION) PANEL SHOF (FANEL LINE) WELDING

110.00 28710.0

Total TMU 1547649.1

1036. COMBINED SUB-OP

WELD BRACKET (KNEE) ON WEB FRAME WITH SEMIAUTOMATIC AT (FFG TYPE) PANEL SHOP (PANEL LINE) WELDING
0NLY COVERS ONE LEG OF THE BRACKET. WELD FOOTAGE = 3 FT.
PER EACH FFG TYPE KNEE BRACKET OFG: 4 23-SEP-82
*WELD FLAT TO WEB WITH 5/16' FILLET.
$ OTHER LEG IS WELDED AFTER UNIT ERECTION

TOTAL TMU 17440.0

Combined sub-operation elements	Freq.	TMU
993. WELD PTIS.l-A1-5/l6 ON ASSEMBLY WITH SEMIAUTOMATIC AT FLAT (WEB STATION) PANEL SHOP (PANEL LINE) WELDING	3.00	15018.0
590 . CLEAN WELDMENT ON ASSEMBLY WITH BRUSH (AND)l PICK) AT ANY (WORK AREA) PANEL SHOP (PANEL LINE) WELDING	4.00	1900.0
747. START (PREPARE + STRIKE ARC) WELDMENT FOR (SEMIAUTOMATIC WELDING) WITH WELDING GUN AT ANY (WORK STATION) PANEL SHOP [PANEL LINE) WELDING		

	2.00	522.0
Total TMU		17440.0

1024. COMBINED SUB-OP

WELD HEADER ON ASSEMBLY WITH SEMIAUTOMATIC AT (4'X4' ANGLE BAR) PANEL SHOP (PANEL LINE) WELDING
HEADER IS 4'X4' ANGLE BAR WELDED ALONG THE LENGTH OF IT FLAT, BOTH END S ARE ALSO WELDED.
PER EACH HEADER OFG: 3 22-SEP-82
* CLEAN EACH INCREMENT PRIOR TO WELDING.
* PUT ON A 1/4' FILLET WELD ON ALL PARTS.

TOTAL TMU 28160.0

Combined sub-operation elements	Freq.	TMU
992. WELD PTlS.l-AI-1/4 ON ASSEMBLY WITH SEMIAUTOMATIC AT FLAT (WEB STATION) PANEL SHOP (PANEL LINE) WELDING 1	3.00	9993.0
998. WELD PT1S.l-AI-l/4 ON ASSEMBLY WITH SEMIAUTOMATIC AT VERTICAL (WEB STATION) PANEL SHOP (PANEL LINE) WELDING	3.00	9819.0
590. CLEAN WELDMENT ON ASSEMBLY WITH BRUSH (AND PICK) AT ANY (WORK AREA) PANEL SHOP (PANEL LINE) WELDING	12.00	5700.0
747. START (PREPARE + STRIKE ARC) WELDMENT FOR (SEMIAUTOMATIC WELDING) WITH WELDING GUN AT ANY (WORK STATION) PANEL SHOP (PANEL LINE) WELDING	8.00	2088.0
425. REPOSITION OBJECT ON ASSEMBLY AT UNIT ASSEMBLY SHOP WELDING	2.00	560.0
Total TMU		28160.0

922. COMBINED SUB-OP

SET-UP AND TEAR DOWN WELDING MACHINE (AND PUT 0N STARTING PADS) FOR SUB-ARC AT (SEAM WELD) PANEL SHOP (PANEL LINE) WELDING
THIS IS MEANT TO C0UER BOTH SIDES OF THE PANEL.
PER EACH COMPLETE PANEL OFG: 4 07-SEF-K!
* COVERS ALL OPERATIONS NEEDED TO PUT ON
* STARTING PADS. ALSO COVERS GETTING THE
# SUB-ARC/TANDEM-ARC EQUIPMENT READY.
* ALSO COVERS GETTING THE 0PERATOR READY.

TOTAL TMU 49938.0

Combined sub-operation elements	Freq.	TMU
917. COMBINED SUB-OP		
SET-UP AND TEAR DOWN (GEAR) FOR (WELDING PADS WITH SEMIAUTOMATIC AT ANY (WORK STATION - SEAM WELD) PANEL SHOP (PANEL LINE) WELDING	1.00	3548.0
921. COMBINED SUB-OP		
SET-UP AND TEAR DOWN WELDING MACHINE (ET. ALL) FOR TANDEM-ARC) AT ANY (WORK STATION - SEAM WELDING) (PANEL LINE) WELDING	SUB-ARC (OR PANEL SHOP	
	1.00	21220.6
920. COMBINED SUB-OP		
WELD PLATE (STARTING PADS) ON ASSEMBLY (PANEL) WITH SEMIAUTOMATIC AT ANY (WORK STATION - SEAM WELD) PANEL SHOP (PANEL LINE) WELDING	1.00	25170.0
Total TMU		49938.0

913. COMBINED SUB-OP

SET-UP TANDEM-ARC FOR (SEAM WELDING) AT ANY (WORK STATION - SEAM WELD) PANEL SHOP (PANEL LINE) WELDING
USE FOR TANDEM-ARC ONLY
PER EACH SEAM SIDE OPG: 3 03-SEP-82
* PREPARE THE MACHINE AT THE SEAM TO WELD

TOTAL TMU 500S.0

Combined sub-operation elements	Freq.	TMU
875. MOVE GANTRY CRANE FOR SUB-ARC AT ANY (WORK STATION - SEAM WELD) PANEL SHOP (PANEL LINE) WELDING	1.00	790.0
869. SET-UP WELDING MACHINE (TANDEM-ARC) AT ANY (WORK STATION - SEAM WELD) PANEL SHOP (PANEL LINE) WELDING	1.00	1340.0
886. CLEAN SEAM ON ASSEMBLY WITH BROOM AT ANY PANEL SHOP (PANEL LINE) WELDING	1.00	2888.0
Total TMU		5008.0

907. COMBINED SUB-OP

WELD (COMPLETE) SEAM (5/8' PLATE) ON ASSEMBLY (PANEL) WITH TANDEM-ARC AT ANY (WORK STATION - SEAM WELD) PANEL SHOP (PANEL LINE) WELDING
THIS IS THE COMPLETE WELD AND USED THE LINCOLN LT56 PER FOOT OFG: 2 03-SEP-82
* WELD THE FIRST SIDE AND CLEAN 25% OF
* THE SLAG. AFTER THE PANEL HAS BEEN
* TURNED OVER, WELD THE SECOND SIDE AND
* AGAIN CLEAN 25% OF THE SLAG. THE REST
* OF THE SLAG SHOULD HAVE BEEN CLEANED
* WHILE THE MACHINE WAS RUNNING.

TOTAL TMU 1594.7

Combined sub-operation elements	Freq.	TMU
887. CLEAN WELDMENT ON (SEAM) WITH HAMMER (PICK) AT ANY PANEL SHOP (PANEL LINE) WELDING	0.50	110.0
896. WELD BUTT ON ASSEMBLY WITH TANDEM-ARC AT ANY PANEL SHOP (PANEL LINE} WELDING	1.00	675.0
897. WELD SEAM ON ASSEMBLY WITH TANDEM-ARC AT ANY PANEL SHOP (PANEL LINE) WELDING	1.00	809.7
Total TMU		1594.7

910. COMBINED SUB-OP

WELD (COMPLETE) SEAM (1′ PLATE) ON ASSEMBLY (PANEL) WITH TANDEM-ARC AT ANY (WORK STATION - SEAM WELD) PANEL SHOP (PANEL LINE) WELDING
THE COMPLETE WELD, USING A LINCOLN LT56
PER FOOT OFG: 2 03-SEP-82
* WELD THE FIRST SIDE AND CLEAN 25% OF
* THE SLAG. AFTER THE PANEL IS TURNED
* OVER, WELD THE SECOND SIDE AND AGAIN
* CLEAN 25% OF THE SLAG. THE REST OF THE
* SLAG SHOULD HAVE BEEN CLEANED WHILE THE
* MACHINE WAS RUNNING.

TOTAL TMU 2901.9

Combined sub-operation elements	Free	THU
887. CLEAN WELDMENT ON (SEAM) WITH HAMMER (PICK} AT ANY PANEL SHOP′ (FANEL LINE) WELDING	0.50	110.0
902. WELD SEAM ON ASSEMBLY WITH TANDEM-ARC AT ANY PANEL SHOP (PANEL LINE) WELDING	1.00	1445.3
903. WELD SEAM ON ASSEMBLY WITH TANDEM-ARC AT ANY PANEL SHOP (PANEL LINE) WELDING	1.00	1346.5
Total TMU		2901.9

930 . WELD (15 FEET OF BAR) PT1S.l-AI-5/16 ON ASSEMBLY (PANEL) WITH DOODLEBUG AT ANY (STIFFENER STATION) PANEL SHOP (PANEL LINE) WELDING
PER 15 FEET OF BAR (30 FEET OF WELD) OFG: 3
PTIS.l-AI-5/16...PL...OB-A-5/16FF

1 5/16′ FLAT FILLET USING .045′ SOLID WIRE.

TOTAL TMU 20329.

933. WELD (25 FEET OF BAR) PTIS.1-AI-5/16 ON ASSEMBLY (PANEL) WITH DOODLBUG
AT ANY (STIFFENER STATION) PANEL SHOP (PANEL LINE) WELDING
PER 25 FEET (OF BAR {50 FEET OF WELD) OFG: 3
PT1S.l-AI-5/l6...PL...DB-A-5/l6FF

1 5/16" FLAT FILLET USING .045" SOLID WIRE.

TOTAL TMU 30825.

939. WELD (35 FEET OF BAR) PTIS.l-AI-5/16 ON ASSEMBLY (PANEL) WITH DOODLEBUG
AT ANY (STIFFENER STATION) PANEL SHOP (PANEL LINE) WELDING
PER 35 FEET OF BAR (70 FEET OF WELD) 0FG: 1
PT1S.1-AI-5/16...PL...DB-A-5/16FF

1 5/16′ FLAT FILLET USING .045′ SOLID WIRE.

TOTAL TMU 41321.

936. WELD [45 FEET OF BAR) PT1S.l-AI-5/16 ON ASSEMBLY (PANEL) WITH DOODLEBUG
AT ANY (STIFFENER STATION) PANEL SHOP (PANEL LINE) WELDING
PER 45 FEET OF BAR (90 FEET OF WELD) OFG: 3
PT1S.1-AI-5/16...PL...DB-A-5/16FF

1 5/16′ FLAT FILLET USING .045′ SOLID WIRE.

TOTAL THU 51816.

1028. COMBINED SUB-OP

WELD WEB FRAME ON ASSEMBLY WITH SEMIAUTOMATIC AT (TANKER) PANEL SHOP (PANEL LINE) WELDING
METHOD FOR FRAME THAT IS 20 FT. LONG WITH 30 IN. FRAME SPACING. WELD FOOTAGE IS: BACKUP STRUCTURE = 26.25 FT.; FLAT = 32 FT.f
COLLARS = 22. 5 FT.
PER EACH WEB FRAME (:6 FT. HIGH) OFG: 4 22-SEP-82
* ALL WELDS ARE MADE WITH SEMIAUTOMATIC
* FLUXCORE. ASSUME THAT A 3/6′ FILLET
* WELD WILL BE APPLIED TO THE FLAT
* BECAUSE IT IS TIGHT. ALSO A 5/16′
* FILLET WELD IS ASSUMED FOR THE BACKUP
* STRUCTURE.

TOTAL TMU 877982.3

Combined sub-operation elements	Freq.	TMU
999. WELD PT1S.l-AI-5/16 ON ASSEMBLY WITH SEMIAUTOMATIC AT VERTICAL (WEB STATION) PANEL SHOP (PANEL LINE) WELDING	26.25	115631.3
590. CLEAN WELDMENT ON ASSEMBLY WITH BRUSH (AND PICK) AT ANY (WORK AREA) PANEL SHOP (PANEL LINE; WELDING	85.00	40375.0
1022. COMBINED SUB--OP WELD COLLAR ON ASSEMBLY WITH SEMIAUTOMATIC AT (TIGHT) PANEL SHOP (PANEL LINE) WELDING	7.50	501720.0
994. WELD PTIS.l-AI-3/8 ON ASSEMBLY WITH SEMIAUTOMATIC AT FLAT (WEB STATION) PANEL SHOP (PANEL LINE) WELDING	32.00	220256.0
Total TMU		877982.3

1026. COMBINED SUB-OP

WELD WEB FRAME ON ASSEMBLY WITH SEMIAUTOMATIC AT (TANKER) PANEL SHOP (PANEL LINE) WELDING
METHOD FOR WEB THAT IS 20 FT. LONG WITH 30 IN. FRAME SPACING. WELD FO OTAGE IS: BACKUP STRUCTURE = 14.25 FT.; FLAT = 32.0 FT.; COLLARS = 17. 4 FT.
PER EACH WEB FRAME (:" 6 FT. HIGH) OFG: 4 22-SEP-82
* ALL WELDS ARE MADE WITH SEMIAUTOMATIC
* FLUXCORE. ASSUME THAT A 5/16' FILLET
* WELD WILL BE APPLIED. USE A VERTICAL
* METHOD FOR ALL WELDS ON BACKUP
* STRUCTURE.

TOTAL TMU 608758.3

Combined sub-operation elements	Freq.	TMU
993. WELD PT1S.l-AI-5}15 ON ASSEMBLY WITH SEMIAUTOMATIC AT FLAT (WEB STATION) PANEL SHOP (PANEL LINE) WELDING	32.00	140192.0
999. WELD PTIS.1-AI-5/16 ON ASSEMBLY WITH SEMIAUTOMATIC AT VERTICAL (WEB STATION) PANEL SHOP (PANEL LINE) WELDING	14.25	62771.3
590. CLEAN WELDMENT ON ASSEMBLY WITH BRUSH (AND PICK) AT ANY (WORK AREA) PANEL SHOP (PANEL LINE) WELDING	61.00	28975.0
1023. COMBINED SUB-OP		
WELD COLLAR ON ASSEMBLY WITH SEMIAUTOMATIC AT (NON-TIGHT} PANEL SHOP (PANEL LINE) WELDING	7.50	356820.0
Total TMU		608758.3

1027. COMBINED SUB-OP

WELD WEB FRAME (LONGITUDINAL WEB) ON ASSEMBLY WITH SEMIAUTOMATIC AT (TANKER) PANEL SHOP (PANEL LINE} WELDING
METHOD FOR WEB FRAME THAT IS 40 FT. LONG WITH 8 FT. BAY Sf SPACING. WELD FOOTAGE IS: FLAT = 80 FT.; VERTICAL = 120 FT.$ PRE-INSTALLED DOCKING BRACKETS = 12 FT.; JOB INSTALLED DOCKING BRACKETS = 25.5 FT.
PER EACH WEB FRAME (>6 FT. HIGH) OFG: 4 22-SEP-82
* ALL WELDS ARE MADE WITH SEMIAUTOMATIC
* FLUXCORE. ASSUME THAT A 3/S′ FILLET
* WILL BE APPLIED TO THE WEB ITSELF AND
* THAT A 5/16′ WELD WILL BE APPLIED TO
* THE DOCKING BRACKETS;

TOTAL TMU 1721852.5

combined sub-operation elements	Freq.	TMU
999.WELD PT1S.l-AI-5/16 ON ASSEMBLY WITH SEMIAUTOMATIC AT VERTICAL (WEB STATION) PANEL SHOP (PANEL LINE) WELDING	37.50	l65187.5
994. WELD PT1S.l-AI-3/8 ON ASSEMBLY WITH SEMIAUTOMATIC AT FLAT (WEB STATION} PANEL SHOP (PANEL LINE) WELDING	80.00	550640.0
1000. WELD PT1S.l-AI-3/8 ON ASSEMBLY WITH SEMIAUTOMATIC AT VERTICAL (WEB STATION) PANEL SHOP (PANEL LINE) WELDING	120.00	818400.0
590. CLEAN WELDMENT ON ASSEMBLY WITH BRUSH (AND PICK) AT ANY (WORK AREA) PANEL SHOP (PANEL LINE) WELDING	395.00	187625.0
Total TMU		1721852.5

1045. COMBINED SUB-OP

WELD BRACKET (TANKER; KNEE) ON WEB FRAME WITH SEMIAUTOHATIC AT
(MEDIUM SIZED) PANEL SHOP (PANEL LINE) WELDING
METHOD FOR WELDING BOTH LEGS OF A TANKER KNEE BRACKET WITH APROXIMATE DIMENSIONS OF 60'X32'. WELD FOOTAGE IS 16.7 FT. OF 5/l6' FILLET WELD
PER EACH MEDIUM BRACKET (60'X32') OFG: 4 27-SEP-82
* ONE LEG IS FLAT AND THE OTHER IS
* VERTICAL. EXTRA CLEAN AND PREPARE/
* STRIKE TIME IS GIVEN TO ALLOW FOR THE
* EXTRA EFFORT OF WORKING AROUND THE
* FACE PLATE OF THE BRACKET.

TOTAL TMU 81405.2

Combined sub-operation elements	FreQ.	TMU
590. CLEAN WELDMENT ON ASSEMBLY WITH BRUSH (AND PICK) AT ANY (WORK AREA) PANEL SHOP (PANEL LINE) WELDING	6.00	2850.0
747. START (PREPARE + STRIKE ARC) WELDMENT FOR (SEMIAUTOMATIC WELDING) WITH WELDING GUN AT ANY (WORK STATION) PANEL SHOP {PANEL LINE) WELDING	6. 00	1566.0
993. WELD PTIS.l-AI-5/'l5 ON ASSEMBLY WITH SEMIAUTOMATIC AT FLAT (WEB 6 TATION) PANEL SHOP (PANEL LINE) WELDING	5.70	28534 .2
999. WELD PTIS.l-AI-5/lA ON ASSEMBLY WITH SEMIAUTOMATIC AT VERTICAL (WEB STATION) PANEL SHOP (PANEL LINE) WELDING	11.00	48455 . 0
Total TMU		81405.2

1046. COMBINED SUB-OP

WELD BRACKET (TANKER; KNEE) ON WEB FRAME WITH SEMIAUTOMATIC AT (LARGE SIZE) PANEL SHOP (PANEL LINE) WELDING
METHOD FOR ONE LEG ONLY OF A LARGE KNEE BRACKET WITH DIMENSIONS OF ABO UT 8 FT. BY 8 FT. WELD FOOTAGE IS 18 FT. OF 5/16' FILLET WELD.
PER EACH LARGE TANKER KNEE BRACKET (8'X8') OFG: 4 27-SEP-82
* WELD ONLY THE FLAT LEG AT THIS TIME.
* THE OTHER LEG WILL BE WELDED AT
* ERECTION. USE SEMIAUTOMATIC FLUXCORE
* TO APPLY A 5/16' FILLET WELD IN THE FLAT
* POSITION. EXTRA CLEAN AND PREPARE/
* STRIKE TIME IS ALOWED IN ORDER TO WORK
* AROUND THE END OF THE FACEPLATE.

TOTAL TMU 92316.0

Combined sub-operation elements	FreQ.	TMU
590. CLEAN WELDMENT ON ASSEMBLY WITH BRUSH (AND PICK) AT ANY (WORK AREA) PANEL SHOP (PANEL LINE) WELDING	3.00	1425.0
747. START (PREPARE + STRIKE ARC) WELDMENT FOR (SEMIAUTOMATIC WELDING) WITH WELDING GUN AT ANY (WORK STATION) PANEL SHOP (PANEL LINE) WELDING	3.00	783.0
993. WELD PTIS.l-AI-5/16 OASSEMBLY WITH SEMIAUTOMATIC AT FLAT (WEB S TATION) PANEL SHOP (PANEL LINE) WELDING	18.00	90108.0
Total TMU		92316.0

1037. COMBINED SUB-OP

WELD HEADER ON ASSEMBLY WITH SEMIAUTOMATIC AT (30 LENGTH} PANEL SHOP (PANEL LINE) WELDING
LARGE HEADER ABOUT 30′ LONG CONTAINS ABOUT 8 FT. OF WELD.
PER EACH LARGE HEADER OFG: 4 23-SEP-82
* USE SEMIAUTOMATIC FLUXCORE AND APPLY
* A 5/16′ FILLET WELD. THE ENDS SHOULD BE
* DONE USING A VERTICAL METHOD.

TOTAL TMU 47244.0

Combined Sub-operation elements	FreQ.	TMU
993. WELD PTIS.l-AI-5J′:5 ON ASSEMBLY WITH SEMIAUTOMATIC AT FLAT (WEB STATION) PANEL SHOP (PANEL LINE) WELDING	5.00	25030.0
999. WELD PTIS.1-AI-5/16 ON ASSEMBLY WITH SEMIAUTOMATIC AT VERTICAL (WEB STATION)PANEL SHOP (PANEL LINE) WELDING	3.00	13215.0
590. CLEAN WELDMENT ON ASSEMBLY WITH BRUSH (AND PICK) AT ANY (WORK AREA) PANEL SHOP (PANEL LINE) WELDING	14.00	6650.0
747. START (PREPARE + STRIKE ARC) WELDMENT FOR (SEMIAUTOMATIC WELDING) WITH WELDING GUN AT ANY (WORK STATION) PANEL SHOP (PANEL LINE) WELDING	9.00	2349.0
Totsl TMU		47244.0

743. COMBINED SUB-OP

WELD (+GOUGE+WELD 2ND SIDE) B2V,lAP (7/16′ GROOVE JOINT) ON ASSEMBLY WITH SEMIAUTOMATIC AT (STEEL) UNIT ASSEMBLY SHOP WELDING
COMPLETE JOB. WELD FIRST SIDE, GOUGE AND WELD SECOND SIDE.
PER 1.0 FOOT OFG: 3 07-JUN-82

TOTAL TMU 32029 .4

Combined sub-operation elements		FreQ.	TMU
719. WELD B2V.1AP (7/16′ GROOVE JOINT) ON ASSEMBLY WITH SEMIAUTOMATIC AT (STEEL) UNIT ASSEMBLY SHOP WELDING		0.01	11591.3
188. CLEAN WELD JOINT ON ASSEMBLY WITH PICK AND WIRE-BRUSH AT ANY SHOP WELDING AREA		0.67	333.3
441. COMBINED SUB-OF′			
WELD GOUGE (SECOND SIDE) ON ASSEMBLY WITH SEMIAUTOMATIC AT VERTICAL UNIT ASSEMBLY SHOP WELDING		1.00	20104.8
Total TMU			32029.4

WHOLE PANEL LINE WELDING COUNT

Titlesheet Organization List

Assemble/Disessemble

922. COMBINED SUB-OF

SET-UP AND TEAR DOWN WELDING MACHINE (AND PUT ON STARTING FADS) FOR SUB-ARC AT (SEAM WELD) PANEL SHOP (PANEL LINE) WELDING
THIS IS MEANT TO COVER BOTH SIDES OF THE PANEL.

913. COMBINED SUB-OF

SET-UP TANDEM-ARC FOR (SEAM WELDING) AT ANY((WORK STATION - SEAM WELD) PANEL SHOP (PANEL LINE} WELDING
USE FOR TANDEM-ARC ONLY

Join

906. COMBINED SUB-OF

WELD (COMPLETE) SEAM (5/16′ PLATE) ON ASSEMBLY (PANEL) WITH SUB-ARC AT ANY (WORK STATION - SEAM WELD) PANEL SHOP (PANEL LINE) WELDING
THE COMPLETE WELD USING A LINCOLN LT7

928. WELD (15 FEET OF BAR) PTIS.1-AI-3/l6 ON ASSEMBLY (PANEL) WITH DOODLEBUG AT ANY (STIFFENER STATION) PANEL SHOP (PANEL LINE) WELDING
PTIS.l-AI-3/16... PL...DB-A-3/16FF

931. WELD (25 FEET OF BAR) PTIS.i-AI-3/16 ON ASSEMBLY (PANEL) WITH DOODLEBUG AT ANY (STIFFENER STATION) PANEL SHOP (PANEL LINE) WELDING
PTIS.l-AI-3/16... PL...DB-A-3/16FF

1035. COMBINED SUB-OF

WELD WEB FRAME ON ASSEMBLY WITH SEMIAUTOMATIC AT (FFG TRANSVERSE) PANEL SHOP (PANEL LINE) WELDING
FOR 12′ WEB 40 FT LONG WITH 27 STIFFS ON 18' SPACING. WELD IS;FLAT=65FT; TIE BUTT=1(3.5FT); STIFF.FACEPLATES=54(ISFT) ; COLLARS=27T AND 27NTC 90FT); SMALL BRKS=14(18FT).

1036. COMBINED SUB-OF

WELD BRACKET (KNEE) ON WEB FRAME WITH SEMIAUTOMATIC AT (FFG TYPE) PANEL SHOP (PANEL LINE) WELDING
ONLY COVERS ONE LEG OF THE BRACKET. WELD FOOTAGE = 3 FT.

1024. COMBINED SUB-OP

WELD HEADER ON ASSEMBLY WITH SEMIAUTOMATIC AT (4'X4′ ANGLE BAR) PANEL SHOP (PANEL LINE) WELDING
HEADER IS 4′X4′ ANGLE BAR WELDED ALONG THE LENGTH OF IT FLAT, BOTH END S ARE ALSO WELDED.

Operate
----

907. COMBINED SUB-OP

WELD (COMPLETE) SEAM (5/8′ PLATE) ON ASSEMBLY (PANEL) WITH TANDEM-ARC AT ANY (WORK STATION - SEAM WELD) PANEL SHOP (PANEL LINE) WELDING
THIS IS THE COMPLETE WELD AND USED THE LINCOLN LT56

910. COMBINED SUB-OP

WELD (COMPLETE) SEAM (1′ PLATE) ON ASSEMBLY (PANEL) WITH TANDEM-ARC AT ANY (WORK STATION - SEAM WELD) PANEL SHOP (PANEL LINE) WELDING
THE COMPLETE WELD, USING A LINCOLN LT56

930. WELD (15 FEET OF BAR) PTIS.l-AI-5/l6 ON ASSEMBLY (PANEL) WITH DOODLEBUG AT ANY (STIFFENER STATION) PANEL SHOP (PANEL LINE) WELDING
PT1S.1-AI-5/16... PL...DB-A-5/16FF

933. WELD (25 FEET OF BAR) PTIS.1-AI-5/16 ON ASSEMBLY (PANEL) WITH DOODLEBUG AT ANY (STIFFENER STATION) PANEL SHOP (PANEL LINE) WELDING
PTIS.l-AI-5/16.. .PL....DB-A-5/16FF

939. WELD (35 FEET OF BAR) PT1S.l-AI-5/16 ON ASSEMBLY (PANEL) WITH DOODLEBUG AT ANY (STIFFENER STATION) PANEL SHOP (PANEL LINE) WELDING
PT1S.1-AI-5/16...PL...DB-A-5/16FF

936. WELD (45 FEET OF BAR) PT1S.l-AI-5/16 ON ASSEMBLY (PANEL) WITH DOODLEBUG AT ANY (STIFFENER STATION) PANEL SHOP (PANEL LINE) WELDING
PT1S.l-AI-5/16....PL...DB-A-5/16FF

1028 COMBINED SUB-OF

WELD WEB FRAME ON ASSEMBLY WITH SEMIAUTOMATIC AT (TANKER) PANEL SHOP (PANEL LINE) WELDING
METHOD FOR FRAME THAT IS 20 FT. LONG WITH 30 IN. FRAME SPACING. WELD F 00TAGE IS: BACKUP STRUCTURE = 26.25 FT.; FLAT = 32 FT.; COLLARS = 22. 5 FT.

1026. COMBINED SUB-OP

WELD WEB FRAME ON ASSEMBLY WITH SEMIAUTOMATIC AT (TANKER) PANEL SHOP (PANEL LINE) WELDING
METHOD FOR WEB THAT IS 20 FT. LONG WITH 30 IN.FRAME SPACING. WELD FO
0
TAGE IS: BACKUP STRUCTURE = 14.25 FT.; FLAT = 32.0 FT.; COLLARS= 17. 4 FT .

1027. COMBINED SUB-OP

WELD WEB FRAME (LONGITUDINAL WEB) ON ASSEMBLY WITH SEMIAUTOMATIC AT (TANKER) PANEL SHOP (PANEL LINE) WELDING
METHOD FOR WEB FRAME THAT IS 40 FT. LONG WITH 8 FT. BAY SPACING. WELD
F
00TAGE IS: FLAT = 80 FT.; VERTICAL = 120 FT.; FRE-INSTALLED DOCKING B RACKETS = 12 FT.; JOB INSTALLED DOCKING BRACKETS = 25.5 FT.

1045. COMBINED SUB-OP

WELD BRACKET (TANKER; KNEE) ON WEB FRAME WITH SEMIAUTOMATIC AT (MEDIUM SIZED) PANEL SHOP (PANEL LINE) WELDING
METHOD FOR WELDING BOTH LEGS OF A TANKER KNEE BRACKET WITH APROXIMATE
D
IMENSIONS OF 60′X32′ WELD FOOTAGE IS 16.7 FT. OF 5/16′ FILLET WELD.

1046. COMBINED SUB-OP

WELD BRACKET (TANKER; KNEE) ON WEB FRAME WITH SEMIAUTOMATIC AT (LARGE SIZE) PANEL SHOP (PANEL LINE) WELDING
METHOD FOR ONE LEG ONLY OF A LARGE KNEE BRACRET WITH DIMENSIONS OF ABO UT 8 FT. BY 8 FT. WELD FOOTAGE IS 18 FT. OF 5/16′ FILLET WELD.

1037. COMBINED SUB-OP

WELD HEADER ON ASSEMBLY WITH SEMIAUTOMATIC AT (30′ LENGTH) PANEL SHOP (PANEL LINE) WELDING
LARGE HEADER ABOUT 30′ LONG CONTAINS ABOUT 8 FT. OF WELD.

743 . COMBINED SUB-OP

WELD (+GOUGE+WELD 2ND SIDE) B2V.1AP (7/16′ GROOVE JOINT) ON ASSEMBLY WITH SEMIAUTOMATIC AT (STEEL) UNIT ASSEMBLY SHOP WELDING
COMPLETE JOB. WELD FIRST SIDE. GOUGE AND WELD SECOND SIDE.

TITLESHEET

M O S T OPERATION TIME CALCULATION

DETAIL/UNIT/PART #	3021-STBD.	REV. LTR/DATE	X
PROCESS/OPER CODE	INNERBOTTOM	STANDARD CODE	PROD
PART NAME	LONG-BHD.		
SHIP CLASS	FALCON	HULL	404
COST CLASS/JOB #	PANEL LINE	TRADE	WELDING
GROUP (UNIT/ZONE)	3020	WORK AREA	X
SUB-GROUP	3021	WORK ZONE	X
SUB-SUB-GROUP	X	WORK CENTER	FNL.LN
CREW/MACHINE	1	ASSET/MACHINE	X
ITEM	GIRTH	SUB-ITEM	STBD .
GEN. DRAWING	200-3030	WORK ORDER	X
DET. DRAWING	X	SHEET	X
WORK PACKAGE	X	APPLICATOR	MWC
OPER. DESCRIPTION	WELD BHD. ASSY. AND SHELL ASSY. THEN BHD. TO SHELL. STBD. IS SHOWN, PORT IS SIMILAR BUT OPPOSITE.		
DATE	17-NOV-82	ISSUE #	3

Step	Method	Instruction		Free
1	SET-UP AND TEAR DOWN WELDING MACHINE (AND PUT ON STARTING PADS)		(922)	.5
	* COVERS ALL OPERATIONS NEEDED TO PUT ON * STARTING PADS. ALSO COVERS GETTING THE * SUB-ARC/TANDEM-ARC EQUIPMENT READY. * ALSO COVERS GETTING THE OPERATOR READY. * FREQ. = 1 PER PANEL.			
2	SET-UP TANDEM-ARC FOR (SEAM WELDING)		(913)	0

```
    * PREPARE THE MACHINE AT THE SEAM TO WELD
    * FREQ. = TWICE PER PANEL SEAM.
3 WELD (COMPLETE) SEAM (5/16' PLATE) ON ASSEMBLY ( 906)          0
    (PANEL) WITH

    * WELD THE FIRST SIDE AND CLEAN 27% OF
    * THE SLAG. AFTER THE PANEL IS TURNED
    * OVER, WELD THE SECOND SIDE AND CLEAN
    * 25% OF THE SLAG.  THE REST' OF THE SLAG
    * SHOULD HAVE BEEN CLEANED WHILE THE
    * MACHINE WAS RUNNING.
    * FREQ. = TOTAL SEAM FOOTAGE.
4 WELD (15 FEET OF BAR) PTIS.l-AI-3/16 ON ASSEMBL( 928)          0
    Y (PANEL) WITH

    * FREQ. = NUMBER OF STIFFENERS AT THIS
    * LENGTH.
5 WELD (25 FEET OF BAR) PT1S.1-AI-3/16 ON ASSEMELY (931)         0
    Y (PANEL) WITH

    * FREQ. = NUMBER OF STIFFENERS AT THIS
    * LENGTH.
6 WELD WEB FRAME ON ASSEMBLY WITH SEMIAUTOMATIC ( 1035)          0
    * USE 7018 STICK WIRE TO WELD THE TIE BUTT
    * AND SINCE THE TIMES ARE COMPARABLE USE
    * #497 FOR THE TIE BUTT RATHER THAN WRITE
    * A NEW SUB-OP.
    * USE 1/4' FILLETS FOR ALL THE OTHER
    * WELDS. USE A VERTICAL METHOD FOR THE
    * STIFFENER FACEPLATES BECAUSE THEY WILL
    * PROBABLY BE DONE WHEN THE COLLARS ARE.
    * FREQ. = NUMBER OF WEBS PER PANEL.
7 WELD BRACKET (KNEE) ON WEB FRAME WITH SEMIAUTOM( 1036)         0
    ATIC

    * WELD FLAT TO WEB WITH 5/16' FILLET.
    * OTHER LEG IS WELDED AFTER UNIT ERECTION
    * FREQ. = 1 PER BRACKET.
8     WELD HEADER ON ASSEMBLY WITH SEMIAUTOMATIC     ( 1024)     0
    * CLEAN EACH INCREMENT PRIOR TO WELDING.
    * PUT ON A 1/4' FILLET WELD ON ALL PARTS.
    * FREQ. = 1 PER HEADER.
9 WELD (COMPLETE) SEAM (5/8' PLATE) ON ASSEMBLY (( 907)          0
    PANEL) WITH

    * WELD THE FIRST SIDE AND CLEAN 25% OF
    * THE SLAG. AFTER THE PANEL HAS BEEN
```

```
     * TURNED OVER, WELD THE SECOND SIDE AND
     * AGAIN CLEAN 25% OF THE SLAG. THE REST
     * OF THE SLAG SHOULD HAVE BEEN CLEANED
     * WHILE THE MACHINE WAS RUNNING.
     * FREQ. = TOTAL SEAM FOOTAGE.
10   WELD (COMPLETE) SEAM (1' PLATE) ON ASSEMBLY (PA( 910)          0
      NEL) WITH

     * WELD THE FIRST SIDE AND CLEAN 25% OF
     * THE SLAG. AFTER THE PANEL IS TURNED
     * OVER, WELD THE SECOND SIDE AND AGAIN
     * CLEAN 25% OF THE SLAG. THE REST OF THE
     * SLAG SHOULD HAVE BEEN CLEANED WHILE THE
     * MACHINE WAS RUNHING.
     * FREQ. = TOTAL SEAM FOOTAGE.
11   WELD (15 FEET OF BAR) PT1S.1-AI-5/l& ON ASSEMBL( 930)          0
      Y (PANEL) WITH

     * FREQ. = 1 PER EACH STIFFENER THIS
     * LENGTH.
12   WELD (25 FEET OF BAR) PT1S.l-AI-5/16 ON ASSEMBL( 933)          0
      Y (PANEL) WITH

     * FREQ. = 1 PER EACH STIFFENER THIS
     *(LENGTH.
13   WELD (35 FEET OF BAR) PT1S.l-AI-5/16 ON ASSEMBLY( 939)         0
       (PANEL) WITH DOODLEBUG

     * FREQ. = 1 PER EACH STIFFENER THIS
     * LENGTH.
14   WELD (45 FEET OF BAR) PTIS.l-AI-5/16 ON ASSEMBL( 936)          7
      Y (PANEL) WITH

     * FREQ. = 1 PER EACH STIFFENER THIS
     * LENGTH.
15   WELD WEB FRAME ON ASSEMBLY WITH SEMIAUTOMATIC ( 1028)          0
      * ALL WELDS ARE MADE WITH SEMIAUTOMATIC
      * FLUXCORE. ASSUME THAT A 3/8' FILLET
      * WELD WILL BE APPLIED TO THE FLAT
      * BECAUSE IT IS TIGHT. ALSO A 5/16'
      * FILLET WELD IS ASSUMED FOR THE BACKUP
      * STRUCTURE.
      * FREQ. = 1 PER EACH WEB OF THIS TYPE.
16   WELD WEB FRAME ON ASSEMBLY WITH SEMIAUTOMATIC ( 1026)          3
      * ALL WELDS ARE MADE WITH SEMIAUTOMATIC
      * FLUXCORE. ASSUME THAT A 5/16' FILLET
      * WELD WILL BE APPLIED. USE A VERTICAL
```

* METHOD FOR ALL WELDS ON BACKUP
* STRUCTURE.
* FREQ. = 1 PER EACH WEB OF THIS TYPE.

17 WELD WEB FRAME (LONGITUDINAL WEB) ON ASSEMBLY W(1027) 1.1
ITH SEMIAUTOMATIC

* ALL WELDS ARE MADE WITH SEMIAUTOMATIC
* FLUXCORE. ASSUME THAT A 3/8′ FILLET
* WILL BE APPLIED TO THE WEB ITSELF AND
* THAT A 5/16′ WELD WILL BE APPLIED TO
* THE DOCKING BRACKETS.
* FREQ. = 1 PER EACH WEB OF THIS TYPE.

18 WELD BRACKET (TANKER; KNEE) ON WEB FRAME WITH S(1045) 4
EMIAUTOMATIC

* ONE LEG IS FLAT AND THE OTHER IS
* VERTICAL. EXTRA CLEAN AND PREPARE/
* STRIKE TIME IS GIVEN TO ALLOW FOR THE
* EXTRA EFFORT OF WORKING AROUND THE
* FACE PLATE OF THE BRACKET.
* 1 PER EACH BRACKET OF THIS TYPE.

19 WELD BRACKET (TANKER; KNEE) ON WEB FRAME WITH S(1046} 0
EMIAUTOMATIC

* WELD ONLY THE FLAT LEG AT THIS TIME.
* THE OTHER LEG WILL BE WELDED AT
* ERECTION. USE SEMIAUTOMATIC FLUXCORE
* TO APFLY A 5/16′ FILLET WELD IN THE FLAT
* POSITION. EXTRA CLEAN AND PREPARE/
* STRIKE TIME IS ALOWED IN ORDER TO WORK
* AROUND THE END OF THE FACEPLATE.
* FREQ. = 1 PER EACH BRACKET OF THIS TYPE.
*

20 WELD HEADER ON ASSEMBLY WITH SEMIAUTOMATIC (1037) 0
* USE SEMIAUTOMATIC FLUXCORE AND APPLY
* A 5/16′ FILLET WELD. THE ENDS SHOULD BE
* DONE USING A VERTICAL METHOD.
* FREQ. = 1 PER EACH HEADER.

21 WELD (+GOUGE+WELD 2ND SIDE) B2V.1AP (7/16′ GROO(743) 0
VE JOINT) ON

* FREQ. = TOTAL FOOTAGE OF VERTICAL SEAM.
*

22 MISC. SMALL PARTS SUCH AS LADDER RUNGS. PAD EYES( ) 6
ETC.

* FREQ. = 1 PER EACH SMALL MISC. PART.

M O S T OPERATION TIME CALCULATION

STEP	SA	FREQ	INTERNAL TMU	EXTERNAL TMU	LOC #
1	0.00	0.50		24969 .	922
2	0.00	0.00		0.	913
3	0.00	0.00		0.	906
4	0.00	0.00		0.	928
5	0.00	0.00		0.	931
6	0.00	0.00		0.	1035
7	0.00	0.00		0.	1036
8	0.00	0.00		0.	1024
9	0.00	0.00		0.	907
10	0.00	0.00		0.	910
11	0.00	0.00		0.	930
12	0.00	0.00		0.	933
13	0.00	0.00		0.	939
14	0.00	7.00		362712.	936
15	0.00	0.00		0.	1028
16	0.00	3.00		1826275.	1026
17	0.00	1.10		1894038.	1027
18	0.00	4.00		325521.	1045
19	0.00	0.00		0.	1046
20	0.00	0.00		0.	1037
21	0.00	0.00		0.	743
22	0.00	6.00		150000.	0
MANUAL TIME(TMU)			0.	4583615.	
ACTUAL PROCESS TIME(TMU)			0.	0.	
FACTORED PROCESS TIME(TMU)			0.		
TOTAL INTERNAL TIME(TMU)			0.		

TITLE SHEET USED IN SETTING STANDARD: 0

M O S T OPERATION TIME CALCULATION

Engineered Operation Time Calculation

Type of work	Elemental Time	Percent Allowance	Allowance Time	Standard Time
EXTERNAL MANUAL	45.836		0.000	45.836
ASSIGNED INTERNAL	(0.000)	() (	0.000) (	0.000)
PROCESS TIME	0.000		0.000	0.000
STANDARD(HRS./CYCLE)	45.836		0.000	45.836
PIECES PER CYCLE	1			
STANDARD HOURS				45.8

APPENDIX D

MWELD MANUAL ELEMENTS DATA

MWELD DATA SUBMITTAL REQUIREMENTS

Machine or Process Type, i.e. Doodlebug with Fluxcore or Tandem Arc, etc.

The manual elements will be entered for each machine or process type. If a machine or process type is used in more than one area and would have different manual element values, the new welding program can address that. When making the submittal, simply give each machine or process type a unique name, such as Doodlebug solid wire and Doodlebut-fluxcored wire.

For each manual element, MOST analyses must be written. The data submitted for input to the MWELD files must include the TMU value for each manual element as well as your locator number.

The following items are required input:

1.	Machine or Process Type	_____	A unique name
2.	Set Up	_____	A percent
3.	Prepare and Strike Arc	_____	TMU value per arc length and either an arc length or a factor.
4.	Change Electrode	_____	TMU value per change.
5.	Clean Pass - (chip Slag)	_____ _____	TMU value per inch and a Factor.
6.	Clean Pass - (wire brush)	_____ _____	TMU value per inch and a Factor.
7.	Restock Electrode	_____	TMU value per electrode or one per spool of wire.

Any questions or comments please contact either Maurice Cunningham or Ezra Creswell at Bath Iron works Corporation, (207) 443-3311, ext. 3592 or 2173.

MANUAL ELEMENTS

1. Initial setup of welding equipment including movement to job location.

   Frequency - It is a constant time and will be applied once per shift as a percentage of normal working time.

2. Prepare to weld and strike arc for each weld including repositioning of body.

   Frequency - Number of trips per joint based on normal length of weld before arc is broken and the body repositioned.

   $\left(\frac{\text{Weld Length x No. of Trips}}{\text{Arc Length}}\right)$ when an arc length is specified

   or $\left(\text{Weld Length x No. of Trips}\right)$ when a factor is specified instead of arc length

   The Factor indicates how often during the course of the weld an automatic machine must stop and restart.

   Example: If we weld a 40 ft. Tee bar with Doodlebug and start and stop the machine twice per bar, the factor would be 0.5, then the arc length would be 20 ft.

3. Change Electrode (Rod or Wire) - A constant time.

   Frequency - Determined by weld program.

4. Clean Pass (chip slag)

   Frequency - Factor x Weld Length x No. of Trips

   1. Factor: A multiplier used to calculate how much of the weld will be deslagged external to the process time.
   2. Weld length is user input.
   3. No. of trips is same as in Strike Arc.

5. Clean (wire brush)

   Frequency - Same as Deslag

6. Restore Supply of Electrode (Rods or Wire) or Flux (Automatic

   Frequency - Function of weld metal deposited.

To complete the file, predetermined TMU values for each of these elements are then entered by the data coordinator since the TMU values for these manual elements may be greater or less for difference size work areas

MWELD MANUAL ELEMENTS DATA

Yard: _____ Date: _____

Data Coordinator: _____

1.	Machine of Process Type:	_____	
2.	Set up:	_____	
3.	Prepare and strike arc:	_____	TMU's/arc length
		_____	Arc length OR factor
4.	Change Electrode:	_____	TMU's per change
5.	Clean pass-(chip slag):	_____	TMU's per inch
		_____	Factor
6.	Clean pass-(wire brush):	_____	TMU's per inch
		_____	Factor
7.	Restock Electrode:	_____	TMU's per electrode or spool

APPENDIX E

UNIVERSAL DATA DEVELOPMENT AND APPLICATION

UNIVERSAL DATA DEVELOPMENT AND AF'F'LICATIUNP

Included within this demonstration packet are guidelines for universal data development. These guidelines recognize the need for 'readable' suh-operations that are immediately useable by all standards groups. Those shipyards employing the MOST computer system should notice the consistency of the sub-operation titles. The titles are self-explanatory and are understandable to any analyst. There are seven examples of universal data sub-operations included within the packet. These are named TOOL.M01 through TOOL.M07. The individual method steps have been written using computer key words. The key words are 'dressed out' by phrases that do not affect the computer generated time values, but add a grammatical soundness to the individual method steps. The method steps are strung together so as to accurately describe the tool's operation. The Computer has been used to print hard copy in such a way as to generaterate a readable form with a total TMU value. These printouts are juxtaposed with the standard Printouts within the packet. Lastly, two examples of the application of universel data are included with the sub-operations named YARD.M01 and YARD.M02. Proper use of the WAIT command has been made (see Pg. 4-52 of the MOST COMPUTER SYSTEMS APPLICATION MANUAL)

showing universal data sub-ops as method steps. The universal data title is copied onto the method step with a location identifier. While standard Procedure is to use a sub-operation within a combined sub-operation, the universal data technique offers the analyst the option of future editing rapidity when the sub-operation filing to the data base is coupled with the MOST ENTER Program. This editing is not available to the combined sub-operation filings to the data base. Use of universal data within a sub-operation allows maximum application of method readabilits as well as easy editins for different but similar shipyard operations. The combined sub-operation would still be used for combining the larger sub-operation that occur with fixed freqency.

UNIVERSAL DATA DEVELOPMENT

**** One basic work area should be used for writing all 'Universal Data Sub-ops'.

***** No walking or body motions should be included.

***** Titles must be clear and specific. Added descriptive words/ phrases should be in parentheses.

***** Repetitive method steps should not be freequencied, but rather they should be repeated where they would logically occur in order to maintain an accurate method description.

***** Each method step 5hould be as clear as Possible. Add Verbage to 'smooth out' the computer phrases wherever needed, but be careful not to change the TMU values.

***** Hard copy of the sub-op should use Format 2 with total TMU's or minutes at the bottom. (Format 2 from the DATA program prints the sub-op title, keg points,and method description. It does not contain index values or method step TMU values.)

***** Presume all items to be within reach.

***** 'Universal Data Sub-ops$ Should be usab1e as a method step in yard specific sub-operations.

(40,3)

TOOL .WO1 TOOL MOl

MOVE ASSEMBLY (3/8 INCH) WITH (DOG & WEDGE) AT ANY (WORK AREA) (BY) MECHANIC
PER ATTACHMENT OFG: 2 21-DEC-82

METHOD DEVELOPED FROM SMALL (5 1 / 2′ X 3 / 4′) HEEL WEDGE. ITEM USED FOR FAIRING OR ALIGNMENT BY STRUCTURAL TRADES.

* UNIVERSAL DATA SUB-OP TO BE USED AS A
* METHOD STEP.

MECHANIC BEGINS AT JOB

1	PLACE DOG FROM TOOLS TO JOB AND HOLD AGAINST PLATE Al BO G1 Al B0 P3 AO	1.00	60.
2	WAIT 727 T WHILE TACKING ATTACHMENT ON ASSEMBLY WITH SMAW (1 / 8 6011) FREQ. FOR 2 IN. DL. 783.	1.00	727.l
3	SLIDE WEDGE BETWEEN DOG AND ASSEMBLY Al BO G1 M3 IO IO AO	1.00	50.
4	FASTEN WEDGE AT ASSEMBLY 5 STRIKES USING HAMMER AND HOLD HAMMER Al B0 G1 Al BO PO F10 AO BO PO AO	1.00	130.
5	INSPECT 3 POINTS CHECKING ALIGNMENT AO BO GO A0 BO PO T3 AO BO PO AO	1.00	30.
6	FASTEN WEDGE BETWEEN DOG AND ASSEMBLY 3 STRIKES USING HAMMER AND ASIDE HAMMER Al BO G1 Al BO PO F6 A1 BO P1 AO	1.00	I10.
7	LOOSEN WEDGE BETWEEN DUG AND ASSEMBLY 3 STRIKES USING HAMMER AND ASIDE HAMMER A1 BO G1 Al BO PO L6 Al BO P1 AO	1.00	110.
8	TOSS WEDGE FROM JOB TO TOOLS Al BO G1 Al BO PO AO	1.00	30.
	TOTAL TMU		1247.

Type D,EM,CT,EX,T,W <or H for help> ?

1149.

(40), 3)
TOOL .W01 TOOL .M02
MOVE ASSEMBLY (1/4 INCH) WITH BOLT (& CLIP) AT ANY (WORK AREA)
(BY) MECHANIC
PER ATTACHMENT OFG: 2 21-DEC-82
METHOD DEVELOPED FROM 5 / 8 BOLT HAVING 12 THREADS / IN..
TACKING FROM MWELD. ITEM USED TO CLOSE GAPS OR FOR ALIGNMENT BY
STRUCTURAL TRADES.
* UNIVERSAL DATA SUB-OP TO BE USED AS A
* METHOD STEP.
* TWO TON PULLING CAPACITY.
MECHANIC BEGINS AT JOB

1	PICKUP BOLT AND CLIP FROM TOOLS TO MECHANIC Al B0 G1 Al BO PO AO	1.00	30.
2	HOLD+PRESS BOLT THROUGH CLIP AT SELF AO BO GO M3 XO IO AO	1.00	30.
3	GET+MOVE WASHER FROM TOOLS TO BOLT AT MECHANIC Al BO G3 Al BO P1 AO	1.00	60.
4	GET+FASTEN NUT ONTO BOLT AT MECHANIC 3 SPINS USING FINGERS Al BO G3 Al B0 P1 F6 AO BO PO AO	1.00	120.
5	HOLD+PLACE ATTACHMENT FROM SELF TO JOB AO BO GO Al BO P3 AO	1.00	40.
6	WAIT 1090 T WHILE TACKING ATTACHMENT ON ASSEMBLY WITH SMAW (1 / 8 6011) FREQ. FOR 3 IN. DL. 783.	1.00	1090.
7	FASTEN NUT AT JOB 12 ARM-STROKES USING SPUD WRENCH AND ASIDE TO TOOLS Al BO G1 A1 BO P3 F67 Al BO P1 AO	1.00	750.
	TOTAL TMU		2120.

Type D,EM,CT,EX,T,W <or H for help> ?

1150.

(40, 3)
TOOL .W01 TOOL .M03
MOVE ASSEMBLY (1 FOOT WITH (CABLE) WINCH AT ANY (WORK AREA)
(BY) MECHANIC
PER EACH TOOL USE OFG: 2 21DEC-82
METHOD DEVELOPED FROM 3000 LB. SINGLE STRAND PULL. LUGALL OR CUM-A-LONG TRADE NAMES ITEM USED TO PULL ASSEMBLY INTO ALIGNMENT BY STRUCTURAL TRADES.
* UNIVERSAL DATA SUB-OP TO BE USED AS A
* METHOD STEP. PRESUMES MINIMUM SLACK
* IN CABLE.
MECHANIC BEGINS AT JOB

1	GET+PICKUP WINCH FROM TOOLS TO MECHANIC Al BO G3 Al BO PO AO	1.00	50.
2	HOLD+PLACE HOOK FROM MECHANIC TO ASSEMBLY AO BO GO Al BO P3 AO	1.00	40.
3	PUSH LOCKS ON WINCH AT ASSEMBLY Al BO G1 Ml XO IO AO	1.00	30.
4	HOLD+SLIDE WINCH AT ASSEMBLY PULLING OUT CABLE AO BO GO M3 XO IO AO	1.00	30.
5	HOLD+PLACE SECOND HOOK FROM MECHANIC TO JOB AO BO GO Al BO P3 AO	1.00	40.
6	PUSH LOCK ON WINCH AT ASEMBLY AND SECURE CABLE DRUM Al BO G1 Ml XO IO AO	1.00	30.
7	OPERATE HANDLE ON WINCH AT JOB SIX STROKES FOR MOVING OBJECT PF 6 (4) Al BO G1 (M6)XO IO AO (6)	1.00	380.
8	PRESS HANDLE WHILE PUSHING LOCK ON WINCH AT JOB AND FREE CABLE DRUM Al BO G1 M3 XO IO AO	1.00	50.
9	HOLD+SLIDE WINCH AT ASSEMBLY LOOSENING CABLE AO B0 GO M3 XO IO AO	1.00	30.
10	HOLD+REMOVE ONE HOOK FROM ASSEMBLY TO MECHANIC WHILE LOCKING DRUM AO BO GO Al BO P1 AO	1.00	20.
11	OPERATE HANDLE ON WINCH AT JOB THREE STROKES PULLING IN CABLE PF 3 (4) Al BO G1 (M6)XO IO AO (3)	1.00	200.
12	GET=REMOVE WINCH FROM MECHANIC TO TOOLS Al BO G3 Al BO P1 AO	1.00	60.
	TOTAL TMU		960.

Type D,EM,CT,EX,T,W <or H for help> ?

1151.

(40) 3)
TOOL .W01 TOOL M04
MOVE ASSEMBLY (2 INCHES) WITH (HYDRAULIC) JACK AT ANY (WORK AREA) (BY) MECHANIC
PER EACH TOOL USE OFG: 2 21-DEC-82
METHOD DEVELOPED FOR 10 & 25 TON FORTA-POWER JACKS. ITEM USED TO PUSH ASSEMBLIES TO LOCATION WITH MODERATE FORCE.
* UNIVERSAL DATA SUB-OF TO BE USED AS A
* METHOD STEP. EIGHT STROKES PER INCH
* OF HEAD TRAVEL.
MECHANIC BEGINS AT JOB

1 GET+PLACE JACK FROM TOOLS TO ASSEMBLY HOLDING JACK-HEAO AGAINST KICKER	Al BO G3 Al BO P3 AO	1.00	80.
2 TURN VALVE ON JACK AT JOB	Al BO G1 M3 XO IO AO	1.00	50.
3 OPERATE HANDLE ON JACK AT JOB MOVING OBJECT PF 16 (4)	A1 BO G1(M6)XO IO AO (16)	1.00	980.
4 TURN VALVE ON JACK AT JOB AND RETRACT PISTON PT 5 S	Al BO G1 M3 X16 IO AO	1.00	210.
5 GET+REMOVE JACK FROM ASSEMBLY TO TOOLS	A1 BO G3 Al BO P1 AO	1.00	60.
	TOTAL TMU		1380.

TYPE D,EM,CT,EX,T,W <or H for help> ?

1152

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(40, 3)
TOOL .W01 TOOL .M05
MOVE ASSEMBLY (1 FOOT) WITH CHAIN HOIST AT ANY (WORK AREA)
(BY) MECHANIC
PER EACH TOOL USE OFG: 2 21-DEC-82
METHOD DEVELOPED FROM RATCHET DEVICE USING SIX TON DOUBLE CHAIN PULL. ITEM USED BY STRUCTURAL TRADES FOR MODERATE TO HEAVY PULLING PRESSURE.
* UNIVERSAL DATA SUB-OF TO BE USED AS A
* METHOD STEP. PRESUMES MINIMUM SLACK
* IN CHAIN.
* 5 STROKES PER INCH OF TRAVEL.
MECHANIC BEGINS AT JOB

1	GET+POSITION HOIST FROM TOOLS TO ASSEMBLY INSERTING MAJOR HOOK	A1 B0 G3 A1 B0 P6 A0	1.00	110.
2	PUSH LOCK ON HOIST AT ASSEMBLY FREEING CLUTCH	A1 B0 G1 M1 X0 I0 A0	1.00	30.
3	SLIDE CLUTCH OUT AT ASSEMBLY FREEING CHAIN	A1 B0 G1 M3 X0 I0 A0	1.00	50.
4	SLIDE CHAIN THROUGH HOIST AT ASSEMBLY PULLING SLACK	A1 B0 G1 M3 X0 I0 A0	1.00	50.
5	PLACE MINOR HOOK FROM MECHANIC TO JOB	A1 B0 G1 A1 B0 P3 A0	1.00	60.
6	SLIDE CLUTCH OUT AT ASSEMBLY FREEING CHAIN	A1 B0 G1 M3 X0 I0 A0	1.00	50.
7	SLIDE CHAIN THROUGH HOIST AT ASSEMBLY TIGHTENING SLACK IN CHAIN	A1 B0 G1 M3 X0 I0 A0	1.00	50.
8	PULL LOCK ON HOIST AT ASSEMBLY ENGAGING CLUTCH	A1 B0 G1 M1 X0 I0 A0	1.00	30.
9	PRESS HOIST-LEVER AT ASSEMBLY PULLING OBJECT 1 FOOT PF 60 (4)	A1 B0 G1 (M3)X0 I0 A0 (60)	1.00	1820.
10	PUSH LOCK ON HOIST AT ASSEMBLY REVERSING CLUTCH	A1 B0 G1 M1 X0 I0 A0	1.00	30.
11	PRESS HOIST-LEVER AT ASSEMBLY LOOSENING CHAIN PF 5 (4)	A1 B0 G1 (M3)X0 I0 A0 (5)	1.00	170.
12	PUSH LOCK ON HOIST AT ASSEMBLY FREEING CLUTCH	A1 B0 G1 M1 X0 I0 A0	1.00	30.
13	SLIDE CLUTCH OUT AT ASSEMBLY FREEING CHAIN	A1 B0 G1 M3 X0 I0 A0	1.00	50.
14	PULL CHAIN THROUGH HOIST AT ASSEMBLY GAINING SLACK	A1 B0 G1 M1 X0 I0 A0	1.00	30.
15	GET+PLACE HOIST FROM JOB TO TOOLS PF 2 (3)	A1 B0 (G3)A1 B0 P3 A0 (2)	1.00	110.
		TOTAL TMU		2670.

Type D,EM,CT,EX,T,W <or H for help> ?

(40, 3)
'TOOL .W01 TOOL .M06
MOVE ASSEMBLY (1 INCH) WITH (BUDDA) JACK AT ANY (WORK AREA)
(BY) MECHANIC
PER EACH TOOL USE OFG: 2 22-DEC-82
METHOD DEVELOPED FROM 35 TON "BUDDA" JACK. ITEM IS A WORM GEAR
DEVICE WITH FIVE INCH DIAMETER PRESSURE PLATE CAPABLE OF FIVE INCH
HEAD TRAVEL.
* UNIVERSAL DATA SUB-OF TO BE USED AS A
* METHOD STEP.
* SIXTEEN 1/4 TURNS OF 4 REVOLUTIONS
* NEEDED TO MOVE HEAD UP OR DOWN 1 INCH.
MECHANIC BEGINS AT JOB

1 GET+PLACE JACK FROM TOOLS TO ASSEMBLY				
	A1 B0 G3 A1 B0 P3 A0		1.00	80.
2 PUSH LOCK ON JACK AT ASSEMBLY INTO UP-SETTING				
	A1 B0 G1 M1 X0 I0 A0		1.00	30.
3 CRANK JACK-GEAR AT JOB 1 REVOLUTION TIGHTENING HEAD AGAINST OBJECT				
	A1 B0 G1 M3 X0 I0 A0		1.00	50.
4 PLACE HANDLE FROM TOOLS TO JACK-GEAR AT ASSEMBLY HOLDING ONTO HANDLE				
	A1 B0 G1 A1 B0 P3 A0		1.00	60.
5 HOLD+PRESS HANDLE AT JOB MOVING OBJECT PF 16 (4)				
	A0 B0 G0 (M3)X0 I0 A0	(16)	1.00	480.
6 PUSH LOCK ON JACK AT ASSEMBLY INTO DOWN-SETTING				
	A1 B0 G1 M1 X0 I0 A0		1.00	30.
7 PRESS HANDLE AT JOB LOWERING HEAD PF 4 (4)				
	A1 B0 G1 (M3)X0 I0 A0	(4)	1.00	140.
8 CRANK JACK-GEAR AT JOB 4 REVOLUTIONS RESETTING HEAD				
	A1 B0 G1 M10 X0 I0 A0		1.00	120.
9 GET+REMOVE JACK AND HANDLE FROM JOB TO TOOLS				
	A1 B0 G3 A1 B0 P1 A0		1.00	60.
		TOTAL TMU		1050.

Type D;EM;CT;EX;T;W <or H for help> ?

1154.

(40, 3)
TOOL .W01 TOOL .M07
SET-UP AND TEAR DOWN (JACKING GOOSENECK) ON (TEE STRUCTURE) WITH BOLTS AT ANY (WORK AREA) (BY) MECHANIC
PER EACH TOOL USE OFG: 2 23-DEC-82
METHOD DERIVED FROM A BOLT-ON DEVICE CONSISTING OF A LARGE ELONGATED DOG - SUITABLE TO JACK AGAINST - WELDED TO A REMOVALABLE FACEPLATE CLAMP.
* UNIVERSAL DATA SUB-OP TO BE USED AS A
* METHOD STEP.
* TWO 3/4 INCH BOLTS WITH NUTS.
* METHOD USED TO MAKE UP CONNECTIONS
* ON TEE-BAR STIFFENERS AND WEBS.
MECHANIC BEGINS AT JOB

1	GET+MOVE GOOSENECK FROM TOOLS TO JOB A1 B0 G3 A1 B0 P1 A0		1.00	60.
2	LOOSEN 2 NUTS ON GOOSENECK AT JOB 6 SPINS USING FINGERS A1 B0 G1 A0 B0 (P1 A1 L10)A0 B0 P0 A0 (2)		1.00	260.
3	PULL MINOR PART OFF GOOSENECK AT JOB A1 B0 G1 M1 X0 I0 A0		1.00	30.
4	GET+POSITION GOOSENECK FROM JOB TO ASSEMBLY HOLDING MAJOR PART WHILE PUTTING MINOR PART OVER BOLTS A1 B0 G3 A1 B0 P6 A0		1.00	110.
5	FASTEN 2 NUTS ON GOOSENECK AT ASSEMBLY 6 SPINS USING FINGERS LOCKING GOOSENECK A1 B0 G1 A0 B0 (P1 A1 F10)A0 B0 P0 A0 (2)		1.00	260.
6	LOOSEN 2 NUTS ON GOOSENECK AT ASSEMBLY 6 SPINS USING FINGERS PREPARING FOR REMOVAL A1 B0 G1 A0 B0 (P1 A1 L10)A0 B0 P0 A0 (2)		1.00	260.
7	PULL MINOR PART OFF GOOSENECK AT ASSEMBLY A1 B0 G1 M1 X0 I0 A0		1.00	30.
8	GET+PICKUP GOOSENECK FROM ASSEMBLY TO MECHANIC A1 B0 G3 A1 B0 P0 A0		1.00	50.
9	REPLACE MINOR PART FROM ASSEMBLY TO MECHANIC REASSEMBLING GOOSENECK A1 B0 G1 A1 B0 P3 A0		1.00	60.
10	FASTEN 2 NUTS ON GOOSENECK AT JOB 6 SPINS USING FINGERS COMPLETING REASSEMBLY A1 B0 G1 A0 B0 (P1 A1 F10)A0 B0 P0 A0 (2)		1.00	260.
11	HOLD+REMOVE GOOSENECK FROM MECHANIC TO TOOLS A0 B0 G0 A1 B0 P1 A0		1.00	20.
		TOTAL TMU		1400.

Type D,EM,CT,EX,T,W <or H for help> ?

(40, 3)
TOOL .W01 YARD .M01
MAKE UP WEB FRAME (TIE-BUTT) ON (FFG-7 CLASS) AT FLAT PANEL SHOP (BY) SHIPFIT
PER TIE-BUTT OFG: 3 23-DEC-82
METHOD DEVELOPED FOR 12 INCH FFG WEBS. ONE TIE-BUTT PER TRANSVERSE WEB.
* MAKE UP DONE WITH BOLT-ON GOOSENECK,
* JACK AND LUGALL.
* UNIVERSAL DATA SUB-OPS USED IN STEPS
* 3, 5 & 7.
* MWELD USED IN STEP 8.
MECHANIC BEGINS AT JOB

1	MECHANIC MOVE FROM JOB TO ASSEMBLY WITH KNEEL CARRYING GOOSENECK A1 B0 G1 A1 B16 P1 A0	1.00	200.
2	INSPECT 3 POINTS CHECKING CONDITION OF WEB A0 B0 G0 A0 B0 P0 T3 A0 B0 P0 A0	1.00	30.
3	WAIT 1400 T & SET-UP AND TEAR DOWN (JACKING GOOSENECK) . TOOL.M07.	1.00	1400.
4	MECHANIC MOVE FROM ASSEMBLY TO JOB WITH 3 STEPS AND BEND STRINGING LUGALL PF 2 (5) A1 B0 G1 A6 (B6)P1 A0 (2)	1.00	210.
5	WAIT 960 T & MOVE ASSEMBLY WITH (CABLE) WINCH ALIGNING FACEPLATE EDGES. TOOL.M03.	1.00	960.
6	MECHANIC MOVE FROM JOB TO ASSEMBLY WITH KNEEL PLACING JACK A1 B0 G1 A1 B16 P1 A0	1.00	200.
7	WAIT 1380 T & MOVE ASSEMBLY WITH (HYDRAULIC) JACK ALIGNING FACEPLATE HEIGHTS. TOOL.M04.	1.00	1380.
8	WAIT 736 T & TACK ASSEMBLY WITH SEMIAUTOMATIC PLACING SIX INCHES OF WELD FROM D.L. 784.	1.00	736.
9	MECHANIC MOVE FROM ASSEMBLY TO JOB WITH 3 STEPS AND BEND REPLACING LUGALL PF 2 (5) A1 B0 G1 A6 (B6)P1 A0 (2)	1.00	210.
10	OPERATE HANDLE ON LUGALL AT JOB 27 STROKES PULLING IN CABLE PF 27 (4) A1 B0 G1 (M6)X0 I0 A0 (27)	1.00	1640.
	TOTAL TMU		6966.

Type D,EM,CT,EX,T,W <or H for help> ?

(40, 3)
TOOL .W01 YARD .M02
MAKE UP WEB FRAME (SECTION) ON (FFG-7 CLASS) AT FLAT PANEL SHOP (BY) SHIPFIT
PER FFG CUTOUT OFG: 2 23-DEC-82
METHOD USED TO MAKE UP FLAT SECTIONS BETWEEN STIFFENERS AND BASED ON 18 INCH FRAME SPACING.
* MAKE UP DONE WITH KING CLAMP, HAMMER,
* BOLT & CLIP AND DOG & WEDGE.
* UNIVERSAL DATA SUB-OPS USED IN STEPS
* 5 AND 8.
* YARD SUB-OP USED IN STEP 3.
* MWELD USED IN STEP 9.
MECHANIC BEGINS AT JOB

1 MECHANIC MOVE FROM JOB TO ASSEMBLY WITH KNEEL A1 B0 G1 A1 B16 P1 A0	1.00	200.
2 INSPECT 3 POINTS CHECKING GAP OPENING A0 B0 G0 A0 B0 P0 T3 A0 B0 P0 A0	1.00	30.
3 WAIT 1790 T & MOVE WEB FRAME ON (PANEL) UNIT C. (KING WEB) CLAMP DL 1019.	1.00	1790.
4 INSPECT 3 POINTS AFTER CLOSING GAP A0 B0 G0 A0 B0 P0 T3 A0 B0 P0 A0	1.00	30.
5 WAIT 471 T & MOVE ASSEMBLY (1 / 4 INCH) WITH BOLT (& CLIP) . FREQ. 6 / 27 OF TOOL.M02.	1.00	471.
6 FASTEN WEB-FRAME AT JOB 3 STRIKES USING HAMMER AND ASIDE TO TOOLS F 2 A1 B0 G1 A1 B0 P0 F6 A1 B0 P1 A0	2.00	220.
7 INSPECT 3 POINTS FOR ALIGNMENT A0 B0 G0 A0 B0 P0 T3 A0 B0 P0 A0	1.00	30.
8 WAIT 369 T & MOVE ASSEMBLY (3 / 8 INCH) WITH (DOG & WEDGE) . FREQ. 8 / 27 OF TOOL.M01.	1.00	369.
9 WAIT 368 T & TACK ON ASSEMBLY WITH SEMIAUTOMATIC. FREQ. FOR 3 INCHES FROM MWELD.	1.00	368.
TOTAL TMU		3508.

Type D,EM,CT,EX,T,W <or H for help> ?

APPENDIX F

CONSULTANT SERVICE

NATIONAL STEEL AND SHIPBUILDING COMPANY

INTER-DEPARTMENT MEMO

Date 11-13-83

To. Jim Ruecker Dept

Subject: LOU KUH'S LAST VISIT TO NASSCO, THURSDAY, DEC. 15, 1982 Job No.

From: Barbara Faison/Bill Oakes Dept

Lou's last vist here at NASSCO was spent reviewing our strategy for NASSCO's Labor Standards Development of the Sheet Metal Shop. We consulted with him concerning the statistical data that we have compiled, mentioned our conclusions and received ideas from Lou as to the best method of study. The Standard Data Format was also discussed.

Lou paid particular attention to the M Weld program, suggesting to us how to gather wELD data until the new welding progrm is on line.

Lou also checked various programs in the computer to see if things were intact.

cc: Ezra Creswell
Bath Iron Works Corp.

220-17

MARAD EXTENSION REPORT - 1. NASSCO Visit, 12/16/82

PURPOSE: To review progress on the FY82 Program: Sheet Metal Shop

SUMMARY:

As of the date of the visit, there were only two analysts working on the program. However, approval had been received to secure an individual from the Sheet Metal Shop *as* of January 3, 1983, to become the third anlyst.

As yet, no standards had been prepared. A considerable amount of work had been completed in terms of tabulating and classifying the various ducts and components. Size ranges had been established, and some standardization had been implemented.

We reviewed the feasibility of using the existing welding program. Because the work is semi-automatic, the current program is suitable for use. We further reviewed the procedure for establishing standards for *size* ranges - by process.

CONCLUSION:

Although progressing at a slower. pace than had been anticipated, the program is moving steadily forward. The team has specific direction, and has now established targets for accomplishment.

Signed: L.M. Kuh

Louis M. Kuh, Consultant

Date: 12/31/83

7 February 1983

Ezra C. Creswell
Program Data Coordinator
Bath Iron Works Corporation
700 Washington Street
Bath, Maine

Subject: Consultant Visit

Dear Ezra:

The consultant, Lou Kuh, visit our facility on January 31st and February lst. The purpose of his visit was to assit us in the development of the model sequences needed for the Mobile Material Handling equipment. After reviewing the accumulated data, Lou instructed us in the method needed to calculate the formulas for the model sequences.

Lou made several recommendations: (1) that more field observations be made and that these results be compared to previous results. The information received from these observations should give us the formula needed for the model sequences; (2) to define the load categories as empiy, secure, oversize and loose and to develop data for each; (3) to calculate a "constant" for each type of material handling equipment based on start-up time, writing lift information, receivin lift information, pick-up time, and drop-off time; and (4? to observe local lifts in the Shop areas and to develop model sequences for them.

Since the transporter doesn't fit into any of the model sequences that we already have, Lou asked us to send him the data that we have so he can review it and make any recommendations.

N.V. Haynes

N V Haynes

Project Manager

MARAD EXTEXSION REPORT - 2. BSC Visit, 1/31/83 and 2/1/83

PURPOSE: To review data collected on the material handling equipment, and to review the method of developing data for. the Material. Handling Sequences.

SUMMARY :

The shipyard has been completely zoned and "addressed" for all material handling operations. Preliminary decisions had been made to use center points" of the various storage areas to measure distances for most fork trucks and similar vehicles. The method was approved as most suitable to the application of standards based on specific locations for specified materials.

The method for developing the constant and the variable was reviewed. It was recommended that a suitable calculator be used to simplify the application Of the Method of Least Squares to the collected data.

Collected data were reviewed for fork trucks and for straddle trucks.' Three load conditions were covered: empty, loaded-loose, and loaded-secure. It was not possible to derive completed formulas for the data because the time values were in whole minutes, which resulted *in* data that did not correlate well.

It was determined that the shipyard was just getting into full swing, and the test data that had been collected were not suitable for use at *this* time because of lack of traffic and expected "delays. It was specified that on future trips, a stop watch would be used to ensure that proper times were defined. A fourth probable category was defined as loaded-large. That category would cover those items that obscure the driver's vision.

Methodology was developed for determining start and stop constants for the straddle trucks, including the need to conduct frequency studies *to* determine the relative frequency of dismounting versus continued operation. The analysts were instructed in the procedure for adding *or* deducting constants from the travel values obtained, to permit continued *use* of the basic MOST formulas that are incorporated in the Computer Program, precluding the need for developing any special. formulas.

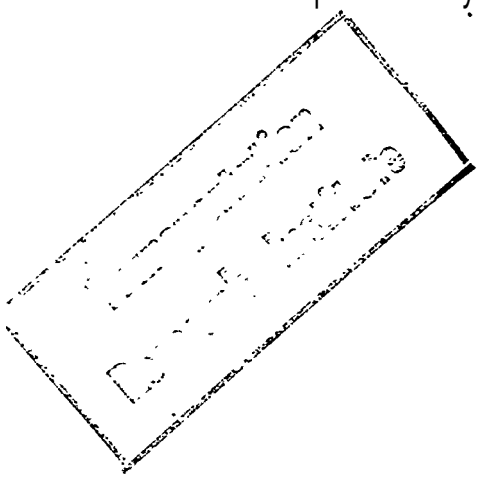
Finally, we reviewed the procedure for developing the transporter data, again to insure that the existing powered truck sequence could be used.

CONCLUSION:

Due to the slow start of shipyard activity, it has not been feasible to collect valid material handling data to date. The current status of the panel line and the platens indicates that proper traffic flow is beginning to form.

Ms. Pelham will be collecting data on the transporter in the near future. Data will be submitted for review, and the formulas developed will be reviewed (by mail).

Finally, we briefly reviewed the method for predetermining the material handling requirements in connection with planned yard work. The program is off to *a* good start relative to the development of yard activity.



Signed: L.M. Kuh

Louis M. Kuh, Consultant

Date: 2/15/83

GENERAL

SHIP DESIGN

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SHIP DESIGN IMPROV

WELDING PROGRAM

SURFACE PREPARATION

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MATERIALS